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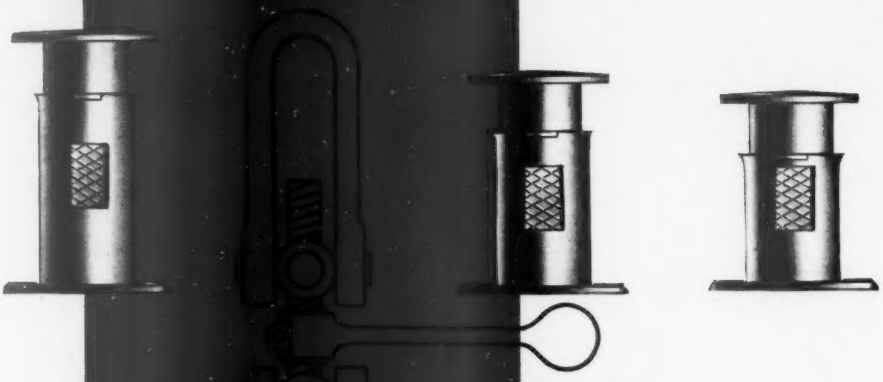

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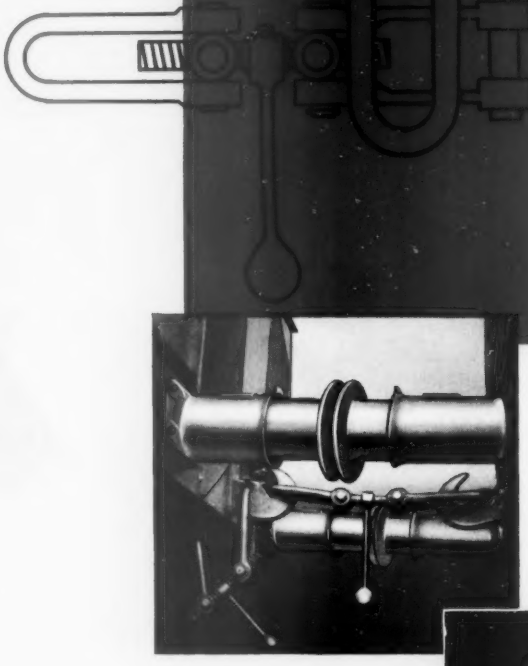

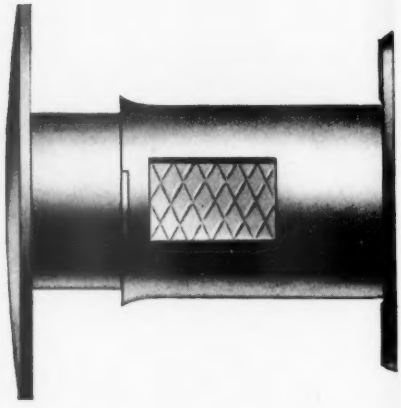

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THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal ESTABLISHED 1835 · RAILWAY RECORD.
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BRISTOL : 20, Victoria Square, Clifton *Bristol 33873*

Annually £5 by post Single copies, Two shillings.
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Editor: B. W. C. Cooke, Assoc. Inst. T.

Vol. 111] FRIDAY, SEPTEMBER 25, 1959 [No. 7

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Pay Claim Moves

DURING the current week there has been some evidence of the lines on which the major trades unions are thinking in regard to autumn wage claims. Both the engineering and shipbuilding employers have been faced with demands for a 40-hour week as well as higher pay. So far it has not been easy to see whether the major emphasis is to be placed on the shorter week or the higher level of wages, although the demand for the 40-hour week is, in fact, little more than a disguised form of approach to higher earnings. There can be no doubt that the stabilisation in the cost of living must have its effect on direct wage claims, and the more responsible of the trade union leaders, at any event, are aware of the fact. It is unlikely, for example, that the executive of the National Union of Railwaymen expects to get much from the approaching final steps of the present negotiations with the British Transport Commission. For this there are very good reasons. Apart from the fact that the long-used argument of making good an increase in a rising cost of living is no longer valid, the British Transport Commission is now faced with the largest deficit it has incurred in its history. There is no immediate prospect, either, so far as can be judged, of any improvement in its financial position which would enable it to go even part of the way towards meeting the claims of the union. Moreover, in the case of the railwaymen there is another and very cogent reason why wage adjustments should be deferred at the present time. The independent review of rates for railway work as compared with those in industry is now believed to be approaching completion. When the report is issued there will probably have to be a number of adjustments made in present wage rates, and it seems unlikely that these can be effected without considerable cost to the Commission. On the other hand, they should be of great value to the unions, not only in the better pay which may accrue to members in some grades or occupations, but in the more realistic acknowledgment of changes in conditions and responsibilities which have occurred over the years and which flat percentage adjustments do not take into account.

Waterloo for all Channel Islands Services

THE decision to make Waterloo the London terminus for Channel Islands boat expresses to and from both Weymouth and Southampton was to be expected in view of the reduction in the number of sailings during the winter, recorded elsewhere in this issue. British Railways, Western Region, presumably will continue to work Channel Islands boat trains between Weymouth and the Midlands in the summer. The former G.W.R. was authorised by an Act of 1871 to operate steamers from Weymouth to St. Malo, Cherbourg, and the Channel Islands. The first service never materialised; the second lasted from 1878 to 1885; and the first G.W.R. ships were placed in service between Weymouth and Guernsey and Jersey in 1889, though packet services from Weymouth in association with the railway date back many years earlier. L.S.W.R. ships plied between Southampton and Guernsey and Jersey in 1862. The reduction in services is inevitable in present circumstances, which include high operating costs. The railway steamer services to the Channel Islands have been lavish in the off-season. Today the total population is about 100,000, and there will be three sailings each way weekly.

Bus and Train Travel

THE impossibility of travel with more, say, than one medium suitcase in most country buses deters many people from using buses to and from railway stations. Often they prefer to travel by private motorcar the whole way, instead of to and from a main-line station. Sometimes arrangements are made for taking accompanied baggage by bus, as between Barnstaple Junction and Lynton. In his letter on page 198, Mr. M. A. Cameron, Principal Officer (Administration), British Transport Commission, states that it is unrealistic to think that people today will not go by bus because buses do not convey trunks. We have considerably lighter baggage in mind. The ability of most trains to carry heavy accompanied baggage is a great advantage for some people. Few buses substituted for train services are convenient. Often they do not connect with trains. It may be impossible to book through, especially from bus to rail. Train and other railway information seems hard to obtain from bus inquiry offices, though particulars of buses more often are obtainable at railway stations. All this is bad for public transport, and especially for the railways. There is ample scope for remedial action.

An Historic Link to be Severed

WITH the announcement last weekend by Robert Stephenson & Hawthorns Limited of the reluctant decision to close down its works at Forth Banks, Newcastle-on-Tyne, within the next six months, there is foreshadowed a termination to the longest single link in the history of locomotive engineering. The reasons are indisputable—a tailing-off in the orders for the smaller types of steam locomotive and the virtual impossibility of modernising the works at economic cost to deal with other products of the English Electric Group. It is 136 years since this, the world's first locomotive works, was founded in Forth Street. Products resulting from the genius of two of the partners, George Stephenson and his son Robert, the centenary of whose death occurs next month, have long been part of the history of engineering achievement in this country. To name only one of many successful designs created there, the *Planet*, built for the Liverpool & Manchester Railway in 1830, determined the

main features of the British steam locomotive for many years. Apart from the human problems involved in transferring as much as possible of the present-day labour force to the more modern plant at Darlington, there will be problems concerning the future use to which the buildings might be put.

Overseas Railway Traffics

EAST African Railways & Harbours approximate railway revenue for July was £1,663,000 compared with £1,587,000 in the same month last year, an increase of £76,000. The greater part of this increase was due to goods traffic receipts which at £1,318,000 were £80,000 higher than in July, 1958. In addition there were small increases amounting to £7,000 in other coaching traffic, livestock, hotel and catering services, and road services. These increases were partly offset by lower earnings from inland marine services, passenger traffic and miscellaneous receipts, which were £11,000 less than in the same month of 1958. Railway operating revenues of the International Railways of Central America for July amounted to $951,719 compared with $1,013,291 in July 1958, a decrease of $61,572. The net revenue from railway operations showed a loss of $194,705 ($143,137), and the net income a loss of £162,912 (£129,907 loss). Costa Rica Railway receipts for August amounted to colones 2,089,741, compared with colones 1,825,316 in August, 1958, an increase of colones 264,425. Figures received from the Central Railway of Western Australia Limited show that estimated road and railway receipts for June 1959, were £A66,059 compared with £A65,362 in June 1958, an increase of £A697.

Gauge Conversion in Iraq

A STANDARD-GAUGE line between Baghdad and Basra has long been considered desirable. It will improve access to the Persian Gulf from the interior, including some of the oilfields, and will be the terminus of the international route, the so-called Baghdad Railway, from the Bosphorus. The existing 350-mile Baghdad-Basra line is on the metre gauge. The late Director General of the Iraqi Railways, General Saleh Zaki Tawfiq, announced that its conversion to 4-ft. 8½-in. gauge, work on which is reported to have begun, is to be completed in 1961, at a total cost of some £4,000,000. The journey time between the capital and Basra is expected to be cut to 6 hr.—not presumably, with steam operation. General Zaki has stated that plans to substitute diesel for steam haulage with oil-fired locomotives have been abandoned in favour of electric traction, which is to be introduced on completion of electric power projects now in course of implementation.

Moscow to Pekin in Seven Days

WHEN the U.S.S.R. and Chinese National Railways completed the new direct line to Pekin across Mongolia in 1955, it was expected that the Trans-Siberian express from Moscow to Pekin would be transferred to the new route and that the 700 miles thus saved would give a correspondingly shorter journey time. From Moscow to Pekin by this route is 4,914 miles, against 5,629 via Harbin and Mukden. This did not materialise, and the through train which began to run from Moscow to Pekin by the new route on January 1, 1957, after the installation of bogie-changing equipment, was some two days slower than the Harbin service, because of its lower speed in Russia and the fact that it spent the best part of a day at the Mongolian capital of Ulan-Bator. Only now has the potentiality of the shorter route been realised, with the diversion over the new line of one of the four-weekly Moscow-Pekin fast trains. This service brings Pekin within seven days of Moscow.

Electric Train Maintenance at Ilford

BY 1961 electrification of the suburban lines from Liverpool Street, and the London, Tilbury & Southend line is expected to be complete. British Railways, Eastern Region, will then have a greatly increased number of multiple-unit electric trains in service in the London area. To cater for the maintenance, cleaning, and periodic overhaul of the trains the existing electric train depot at Ilford has been extended. This work and the facilities provided are described elsewhere in this issue. The operations to be carried out in the new shed will include interior and exterior cleaning, renewal of brake blocks, and light repairs and adjustments to underslung equipment. A feature of the depot is the manner in which services and connecting points have been distributed. Because of the small amount of space left between the pits for vehicles, it was decided to excavate a basin over almost the whole area of the site to the level of the pit base, and bridge the spaces between the pits with pre-stressed concrete slabs forming the floor of the shed. The tunnels created were then used for the accommodation of the services which were mounted on the pit walls.

Central Laboratory for London Transport

A FEATURE of the Central Laboratory being built at Chiswick for the London Transport Executive is to be a fatigue-testing machine for the axles of rolling stock on the London Underground system. This machine will be the only one of its kind in Great Britain and is being designed and constructed under an extramural contract placed with the University of Nottingham. It will be used for investigations into the effect of variations in axle-steel grades and methods of cold rolling. This should result in improvements which will virtually eliminate any tendency for fatigue cracks to develop during the service life of axles. At present the Research Department's services of regular testing of supplies, technical control of works, investigating day-to-day problems, and long-term research are housed in portions of four scattered premises and three temporary huts. The new building, which is described elsewhere in this issue, has been designed to accommodate a staff of about 80. The layout aims to keep related functions together using both existing and new apparatus. Space will be reserved for the installation of further equipment as the need arises.

Russian Multiple-Unit Stock

BECAUSE of the rapid progress made in recent years with the electrification of the Russian Railways it has been necessary to develop new multiple-unit rolling stock for use in the suburban services round Moscow, Leningrad, and Kharkov. Five experimental trains were put into service during 1957, to meet the requirements for improved overall performance, and series production began during the second half of 1958. The trains, which are described elsewhere in this issue, consist of 10 cars: two driving trailers, five motor coaches, and three intermediate trailers. It is possible to make up trains of four, six, or eight vehicles, half of which are motor units. The coach bodies are of all-welded construction designed as a single shell. Use is made of floor, side, and roof members to ensure the necessary resistance at a relatively low weight. The double sliding entrance doors are of welded construction and are pneumatically operated from the driver's cab. There is one operating cylinder for each half of the doors. The self-ventilated 1,500-V motors develop 197 kW. at 830 r.p.m., one hr. rating and 145 kW. at 945 r.p.m. continuously. No provision is made to cut out defective motors, for with five motor coaches, it is permissible to cut out the complete motor coach without unduly affecting the train performance.

Brunel Centenaries

ISAMBARD Kingdom Brunel has been the subject of two centenary celebrations this year. Completion in 1859 of his greatest single civil engineering achievement, the Royal Albert Bridge at Saltash, was commemorated last May, as recorded in our May 8 issue. The bridge carries the main line of British Railways, Western Region, successor to the Cornwall Railway, over the Tamar. The Region collaborated with the local authorities in organising the celebrations, including an exhibition of models, relics, and so on, at Plymouth, nearby. Brunel died on September 15, 1859. At Paddington Station, the terminus which he himself designed, the Western Region recently staged an admirable exhibition illustrating Brunel's character and achievements. Last week, as described on another page, a commemorative plaque was affixed to another Brunel structure, Clifton Suspension Bridge,

Bristol. This road bridge over the Avon gorge has railway associations. The chains intended for it had been bought by the Cornwall Railway for the Saltash Bridge, and Sir John Hawkshaw, who subsequently became engineer of the Clifton Bridge obtained the chains from the Hungerford suspension bridge—another of Brunel's creations—which was being demolished to make room for the Charing Cross Railway Bridge.

Periodic Locomotive Inspections in the U.S.A.

NEW rules have been laid down by the Interstate Commerce Commission for the regular inspection of locomotives in the U.S.A. Each locomotive in road service must receive a mechanical inspection at least once every 24 hr. In through runs, the inspection must be at the first point where crews are changed after 24 hr. Shunters must be inspected once every 24 hr. At first, by a misinterpretation of the instruction, an inspection of road locomotives was called for at every crew change. The railway managements objected to this excessive caution. They pointed out that between 1946 and 1957, whereas with steam locomotives the average failure was once every 3,671,174 locomotive-miles, the corresponding figure for diesel locomotives was 12,205,528. The instruction was then amended to make it clear that inspection every 24 hr. would suffice. Reports of defects and repairs must be made in the approved form at the home depot and not necessarily the inspection point, and any defects which violate I.C.C. regulations must be repaired before it is used again. A record of inspections must be kept on each locomotive. Any competent employee may be detailed to make an inspection.

Reflections on 40 years' Railway Service

IN his Presidential address to the Institution of Locomotive Engineers in London last Tuesday, Mr. R. A. Smeddle, Chief Mechanical & Electrical Engineer, Western Region, British Railways, revealed a great breadth of personal experience gained during some 40 years of railway service. Several developments and events of great significance made a first-class background for his training and service, part of which was under Mr. (later Sir) Nigel Gresley. One such development was the introduction in 1925 of steam railcars on services which were otherwise uneconomic.

A scheme which almost matured in 1921 might well have influenced the whole system of railways in this country when viewed in the perspective described by Mr. Smeddle. It was towards the end of his pupilage in the former North Eastern Railway at Darlington under Sir Vincent Raven, that Mr. Smeddle was engaged on the dynamometer car trials of the 1,500 V. d.c. 2-Co-2 prototype express passenger electric locomotive which Raven hoped would be the forerunner to a fleet for an electrified York-Newcastle main line. The board of the N.E.R. had agreed to the electrification but it was shelved on amalgamation taking place with the London & North Eastern Railway when Raven retired. Mr. Smeddle believes that, had the scheme proceeded 37 years ago and been developed, British Railways would now have been in a much healthier position. Undoubtedly extensions on the Great Northern main line from York south to London would have taken place and this would have induced other railway companies also to consider electrification.

Among recent developments mentioned by Mr. Smeddle are the fast inter-city main-line diesel trains for the hourly interval service between Edinburgh and Glasgow. These had to be built at Swindon Works to meet the same overall structural specification as British Railways main-line stock but the necessity for weight saving and machinery-space considerations dictated that the stressed-body principle should be used. This was to replace the trussed underframe which alone on previous stock was sufficiently heavy to comply with the strength requirements. The complex stress analysis of the new design with combined sides, roof, and floor was subjected to exhaustive practical tests at the Vitry testing station of French National Railways in accordance with procedure set down by the Office for Research & Experiments for international coaching stock. Two hundred tons compressive load applied at drawbar height to simulate collision conditions revealed no unduly high deformation to indicate particular points of weakness in the design. Strain gauges recorded the stresses at 248 places on the steel coach frame as part of a check on vital calculations.

Investigations based on these and similar tests have led to a more critical analysis of stressing throughout the vehicle and the development of an integral steel body which, Mr. Smeddle says, will be nearly 2½ tons lighter than the comparable structure of the present standard B.R. coach. The advantage of any reduction in the weight of coaching stock which can be carried out economically should be apparent in the light of efforts to improve train speeds and reduce motive power costs to a minimum.

One of several illustrations used by Mr. Smeddle shows the weight analysis of a standard B.R. coach. He believes in the ideal that bogies, at present constituting one-third of the total, must be reduced in weight and at the same time give improved riding characteristics with reduced maintenance costs. Also he warns against sacrificing passenger comfort in achieving other aims.

Mr. Smeddle has given much thought to the design of a new dynamometer car for the Western Region. Using electronic methods of measurement and recording, all the essential measurement data will be presented in a form which will permit rapid and critical appraisal. Strain gauge transducers for measuring draw bar pull at either end will make it unnecessary to turn the vehicle between runs. Tractive-effort/speed curves and speed/distance/time curves will be produced automatically with the aid of transducers and servo motors.

Hydraulic drive has been incorporated in 10 Swindon-built 2,000-h.p. main-line diesel locomotives in service on the Western Region and others supplied by the North British Locomotive Co. Ltd. Mr. Smeddle justifies the decision to eliminate the electrical energy stage in main-line diesel locomotives by making reference to favourable experience in Germany with the reliability of hydraulic transmission. The further advantage of weight-saving is achieved in the Swindon-built locomotives by using fast-running diesel engines and partly by following the German Krauss-Maffei design principle. The subject of weight is thrown into bold relief by Mr. Smeddle's comparison between the two current types of 2,000-h.p. Western Region diesel-hydraulic locomotives, one weighing 78½ tons, and the other 117 tons. It is obvious, he states, that on any route, the first locomotive will be able to haul an additional 40 tons.

In referring to the future, Mr. Smeddle makes a plea for greater simplification of diesel locomotives, particularly the auxiliary equipment, control gear, and various protection devices. The latter, he maintains, should be more robust to avoid causing the unnecessary shut-downs which can occur in practice. He expresses the opinion that the efficient use of diesel power to re-arranged timetables should bring about the expected revival of the railways despite the increasing competition of road haulage.

Mr. Smeddle ended his address with a suggestion that the older members should regard it their duty to urge younger men engaged in engineering for the railways to enjoy the benefits which can be placed before them by joining the Institution at an early stage in their careers.

The Interim Winter Passenger Timetables

AS already announced, the 1959-60 winter passenger timetables of the several Regions of British Railways are not being introduced until November 2. For the time being the summer timetables are being continued with supplements giving alterations to the summer services. These are mostly the withdrawal, normal in September, of all the special summer trains, particularly at week-ends. Certain other changes merit attention.

In the Western Region the summer acceleration of the "Bristolian" to 100 min. schedules between Paddington and Bristol, involving average speeds of 71 m.p.h. down and 70.6 m.p.h. up, proves to have been temporary, and the previous 105 min. booking is now reverted to. The 2.55 p.m. from Paddington to Swansea and 7.30 a.m. from Swansea (9 a.m. from Cardiff) to Paddington, introduced experimentally in the middle of the summer, have proved successful, and are being continued, with buffet car in each direction. Buffet cars are also provided on the 9.25 a.m. and 4.25 p.m. from

XUM

Bristol to Weymouth and on the 12.40 and 7.40 p.m. from Weymouth to Bristol.

The 9.50 a.m. down "Royal Scot" of the London Midland Region from Euston is continuing for the time being to run non-stop to the Border, calling at Carlisle Citadel at 3.10 p.m. It continues to reach Glasgow Central at 5.15 p.m., except on Saturdays, when it is 45 min. later. The Aberdeen portion runs independently, at 10 a.m. from Euston. As usual in winter it is attached at Crewe to the 11.20 a.m. from Birmingham to Edinburgh and Glasgow. The latter is decelerated considerably compared with last winter; it does not reach Glasgow till 6.42 p.m. or Edinburgh Princes Street till 6.33 p.m., 19 min. later at both.

In the Eastern Region a considerable alteration will be made from October 4 in the "Day Continental" service to and from Liverpool Street, because of withdrawal of the through German diesel train between the Hook of Holland and Hamburg, which permits a later arrival at the Hook. The start from London will be at 9.40 instead of 8.20 a.m., and the Hook will be reached at 6.45 p.m. (Central European time) instead of 5.30 p.m. In the reverse direction departure from the Hook will be at 12 noon instead of 1.5 p.m., and the Parkeston arrival 5.30 instead of 6.30 p.m.; the "Day Continental" will reach Liverpool Street 44 min. earlier, at 7.39 p.m. For the time being, the full hourly service between Liverpool Street, Clacton-on-Sea, and Walton-on-the-Naze is being continued.

On the East Coast main line, with the withdrawal of the London-Edinburgh non-stop "Elizabethan," the through coaches for Aberdeen are transferred, as usual, to the 10 a.m. "Flying Scotsman"; in the up direction there is a restoration of the former through coach service to London by the 5.47 a.m. from Aberdeen, attached to the up "Flying Scotsman" at Edinburgh Waverley. The Saturday working in each direction of the "Sheffield Pullman," which was tried during the summer, has been discontinued. Very considerable additions, up to 45 min. and more, are being made to the overall times of the night trains between Kings Cross and Edinburgh on the last two Saturday nights in September and the first two in October, because of engineering work which will make it necessary to divert the trains between Grantham and Retford or Doncaster via Lincoln, and between Darlington and Durham via Bishop Auckland.

The Southern Region summer electric service on weekdays between Victoria, Chatham, Sheerness, Margate, Ramsgate and Dover from Mondays to Fridays inclusive is continued without any curtailment other than the withdrawal of the 10.28 a.m. and 12.37 and 3.35 p.m. reliefs to the regular express trains at 40 min. past the hour from Victoria, and the corresponding reliefs in the up direction. The Saturday service, however, is extensively cut down, but only to correspond in frequency with that on the other weekdays. Elsewhere a new daily service for night workers is run from London Bridge at 3.27 a.m. to Eastbourne, calling at principal stations to set down passengers only and arriving at 5.33 a.m. This is the second part of the 3.20 a.m. parcels and news train which also carries passengers and hitherto has run to Eastbourne via Brighton; it now terminates at Brighton and no longer calls at Haywards Heath. Among minor alterations, the 5.35 p.m. from Waterloo to Portsmouth calls also at Godalming.

British Transport Commission Traffic Receipts

DURING the four weeks ended September 6 the weather in most parts of Great Britain favoured excursion travel. British Railways passenger receipts for the period were £332,000 more than for the corresponding weeks of last year. In view of the great efforts made to improve services, partly by introducing railcars, and to quote attractive fares, a greater increase might have been expected.

It would be interesting to know to what extent the slight increase in London Transport road passenger receipts was at the expense of Underground traffics. L.T.E. buses and motor-coaches no doubt carried many excursionists as probably did the Scottish and provincial buses. It is not clear why L.T.E. railways did not do better, apart perhaps from a reduction during the holiday season in the numbers travelling to and from work. The rise in ships' passenger receipts seems the result partly of increased travel from and to the Continent.

	Four weeks to Sept. 6, 1959		Increase or decrease	Aggregate for 36 weeks		Increase or decrease
	1959	1958		1959	1958	
Passengers :	£000	£000	£000	£000	£000	£000
British Railways ...	13,307	12,975	+ 332	100,022	99,825	+ 197
London Transport :						
Road Passenger Services	4,312	4,271	+ 41	37,609	31,648	+ 5,961
Railways	1,751	1,786	— 35	16,148	16,958	— 810
Provincial & Scottish Buses	5,714	5,584	+ 130	42,836	42,405	+ 431
Ships	1,424	1,231	+ 193	5,981	5,497	+ 484
Total Passengers ...	26,508	25,847	+ 661	202,596	196,333	+ 6,263
Freight, Parcels & Mails:						
British Railways						
Merchandise & livestock	7,087	7,251	— 164	65,771	71,413	— 5,642
Minerals	3,144	3,018	+ 126	29,415	31,408	— 1,993
Coal & coke	7,100	8,097	— 997	74,416	85,153	— 10,737
Parcels, etc., by coaching train	4,179	4,124	+ 55	36,493	36,046	+ 447
Total Freight, British Railways	21,510	22,490	— 980	206,995	224,020	— 17,925
Others*	4,359	4,153	+ 206	37,542	36,862	+ 680
Total Freight, Parcels and Mails	25,869	26,643	— 774	243,637	260,882	— 17,245
Total	52,377	52,490	— 113	446,233	457,215	— 10,982

* Road haulage, ships, and inland waterways freight

British Railways mechandise receipts continued below the total for Period 9 of 1958, which was poor. These traffics do not reflect the great amount of effort being made by railway traffic staffs to capture and retain traffic. The situation is serious, for a great deal of railway revenue must be derived from merchandise. It is too soon to expect much increase in mineral receipts, though they are markedly better than for this period of last year. Coal class traffics follow the trend already apparent and allowed for by the Commission in re-appraising its financial position and needs under the modernisation plan for the railways. A drop of nearly £1,000,000 nevertheless is startling, especially in view of the contribution formerly made to railway revenues by the carriage of coal.

The £11,000,000 or figure approaching it, by which the traffic receipts of the Commission for 36 weeks of the current year fall short of the total for these weeks of 1958, is considerable in relation to turnover. It is certainly disappointing, for by this date in 1959 it might have been hoped that action taken would have resulted in higher passenger revenue and in railway freight receipts at least holding their own.

PERCENTAGE VARIATION 1959 COMPARED WITH 1958

	Four weeks to September 6	36 weeks to September 6
British Railways :		
Passengers	+ 2.5	+ 0.2
Parcels	+ 1.3	+ 1.2
Merchandise & livestock	— 2.2	— 7.8
Minerals	+ 4.1	— 6.3
Coal & coke	— 12.3	— 12.6
Total	— 1.8	— 5.4
Ships (passengers)	+ 15.6	+ 8.8
British Road Services, Inland Waterways and Ships (cargo)	+ 4.9	+ 1.8
Road Passenger Transport, Provincial & Scottish ...	+ 2.3	+ 1.0
London Transport :		
Railways	— 1.9	— 4.7
Road services	+ 0.9	+ 18.8
Total	—	+ 10.5
Aggregate	— 0.2	— 2.6

Indian Railways in 1957-58

WE have received from Mr. P. C. Mukerjee, Chairman of the Indian Railway Board, a copy of that administration's report for the year ended March 31, 1958. It announces a number of new records in such statistics as number of passengers and goods traffic originating, passenger- and ton-miles, net ton-miles per wagon-day, loads of goods trains and net ton-miles per goods train hours. Gross earnings of all railways in India continued to rise at a nearly steady rate of well over Rs 30 crores or £24,000,000 a year, the total for 1957-58 reaching Rs 382.99 crores, or slightly over £287,240,000.

Though the growth of Indian industrial production diminished during the later months of the year under review, the rising trend was generally maintained, and there were marked increases in the out-turn of cement by 14 per cent, and both coal and salt by over 10 per cent. Other higher outputs were in machinery, textiles, jute, sugar, chemicals and drugs. The temporary set-back was due to import cuts restricting the supplies of raw materials to certain industries. The increase in goods earnings resulted from a greater volume handled and an increased supplementary charge from July 1, 1957. That in passenger receipts was due to the increased number of passenger-journeys.

The principal results of working during this and the preceding year were as follows:

	1956-57	1957-58	Percentage variation
Passengers originating (millions) ...	1,382.5	1,431.1	+ 3.51
Passenger-miles (millions)	42,194.5	43,332.8	+ 2.70
Passenger earnings (Rs crores)	117.39	120.08	+ 2.29
Average passenger journey (miles) ...	30.5	30.3	− 0.66
Freight tons carried (millions)	125.4	133.4	+ 6.37
Net ton-miles (millions)	40,221.0	44,897.0	+ 11.6
Goods earnings (Rs crores)	201.09	225.72	+ 12.2
Average miles a ton of goods was carried	320.8	336.7	+ 4.96

Turning now to the Government Railways, the general picture closely resembles the one above. Increases in train-miles were 2.26 per cent passenger and 5.08 per cent goods. There were also increases in wagons loaded of 4.87 per cent on the 5 ft. 6 in. and a total of 7.61 per cent on the metre-gauge systems.

The gross receipts of Government Railways, including lines worked by Government on behalf of other owners and also including suspense figures, totalled Rs 379.78 crores (£284,840,000) as compared with Rs 347.57 crores (£260,680,000) in 1956-57 or over £24,000,000 more. Ordinary working expenses, including suspense, amounted to Rs 264.18 crores, against Rs 233.94 crores in the previous year, an increase of Rs 30.24 crores. Contribution to Depreciation Reserve Fund was Rs 46.23 crores, of which Rs 45 crores were on account of the capital assets of the Government Railways chargeable to their working expenses. The balance of Rs 1.23 crores is on account of capital assets of the Chittaranjan and Integral Coach factories.

The net expenditure on miscellaneous transactions during 1957-58 was Rs 12.56 crores as against Rs 9.92 crores in 1956-57 and the net revenue for the year was Rs 57.78 crores (Rs 58.38 crores), the figures in brackets being the corresponding ones for the previous year. The dividend paid to General Revenues was Rs 44.40 crores (Rs 38.16), so that the surplus was Rs 13.38 crores (Rs 20.22), a decrease of Rs 6.84 crores

On March 31, 1958, the total route-mileage of railways in India open for traffic was 34,889 miles, of which 34,462 were Government lines. These figures include 168 miles of new railway completed and opened during the previous year; 36 of these miles were parts of the Khandwa-Hingoli metre-gauge link, 23 miles were part of the Northern Railway Barhan-Etah chord, and 59 miles were sections of the South Indian Quilon-Ernakulam line. In addition, 555 miles of new line were under construction during the year under review. No lines were closed.

As from January 15, 1958, a new railway administration was created to operate the section of the North Eastern Railway east of Katihar and thenceforth known as the North East Frontier Railway. On that date it had a route-mileage of 1,738 miles, including 74 miles worked but not owned by the Government. This left the N.E.R. with 3,060 route-miles. The headquarters of the N.F.R. were established at Pandu, on the South bank of the Brahmaputra River near the sites of the existing wagon-ferry and future bridge. The 26-mile narrow-gauge Kalighat-Falta Railway was acquired by the Government of India as from March 31, 1957, but was closed to traffic on the following day.

In addition to the 555 miles of new construction mentioned above, the following major civil engineering works were in hand. On the great Mokameh Ganges Bridge and its ancillary works 65 per cent had been completed by the end of the year under review. Another big bridge over the Gandak River, estimated to cost Rs 2.02 crores, or £1,515,000, about 47 per cent of the work had been completed. Good progress was also made on the preliminaries for the Brahmaputra Bridge near Pandu.

Work on the Calcutta suburban electrification made good progress, and the Howrah-Sheoraphuli service was inaugurated on November 30, 1957, and that from Howrah to Bandel on December 14 of that year. These electrifications were sanctioned as 3,000-V. d.c. undertakings, but subsequently the Railway Board decided to adopt the 25kV. a.c. single-phase 50-cycle traction system. Accordingly 100 mixed-traffic a.c. locomotives were ordered from a group of Continental firms and 10 from Japan. Global tenders were invited for the supply of overhead equipment for 700 route-miles of line to be electrified.

During 1957-58 603 locomotives were placed in service, 225 5 ft. 6 in. gauge and 378 metre gauge. Of the former, 164 " WG " engines were built at Chittaranjan Locomotive Works and 85 metre-gauge locomotives were supplied by Tatas. Additionally, 384 new locomotives were ordered during the year, 282 broad gauge, 60 metre-gauge and six narrow gauge. Of the 282, 100 were electric locomotives being supplied by a Swiss consortium and another 10 from Japan; the remaining 172 were steam " WG " engines from Chittaranjan. The 60 metre-gauge locomotives are " YG's " ordered from Tatas. Two of the narrow-gauge engines were on order from builders in the United Kingdom, and the other four from Japan.

During the year, 915 broad-, 424 metre-, and 69 narrow-gauge coaches were taken into service, 141 of the broad-gauge vehicles were electric multiple-unit coaches and 12 were railcars all imported. The remaining 1,408 coaching vehicles were turned out by Indian workshops. Orders were also placed for 759 5 ft. 6 in. gauge and 448 metre-gauge coaches, all with Indian shops.

The position with regard to wagons in terms of four-wheel vehicles was as follows :

	Broad gauge	Metre gauge	Narrow gauge
Number placed in service	19,894	9,674	66
Indigenous	13,088	4,082	46
Imported	6,806	5,592	20
Number ordered	1,632	962	—

On July 12, 1957, a Loan Agreement was concluded with the World Bank involving the supply of railway material by nine foreign countries valued at Rs 42.8 crores (£32,100,000). The equipment to be supplied included locomotives, coaches, wagons and parts, boilers, underframes, rails and other track components.

Altogether it will be noted that during 1957-58, the second year of the Second Five-year Plan, implementation of the Plan had proceeded satisfactorily. The Government Railways had carried 8,000,000 more tons of freight and 50,000,000 more passengers than in the previous year. Efforts towards increased operational efficiency, rehabilitation of depleted assets, and a bold modernisation programme all contributed to successful achievement during that year.

Changes in Argentina

(*By a correspondent*)

THE recent political upheaval in Argentina has resulted in changes imposed by armed forces in the higher Direction of nationalised transport. Eng. Alberto R. Costantini, Secretary for Transport, and Eng. Victor S. Mangonnet, Under-Secretary, were appointed Minister and Under-Secretary respectively of Public Works & Services, while Eng. Dr. Manuel F. Castello, Director of the National Railway Board in 1928-32, became Secretary for Transport with Eng. Bernardo Loitegui as Under-Secretary. Before these changes took place, the Administrators of the several railways had been relieved of their posts and military commissioners appointed in their places.

The result of the thorough political shake-up was the resignation of all these commissioners and of the Presidential Delegate in the State Railways (E.F.E.A.), General Lambardi, and the nomination of an experienced railwayman, Eng. Guido C. Belzoni, to the latter post. His first act was to reinstate the Administrators. The present situation is that the former Directors of E.F.E.A. have been temporarily replaced by the Presidential Delegate.

Another change insisted on by the armed forces was the

ending of the mobilisation of transport workers. This was immediately carried out, but acts of indiscipline started again almost at once. The headquarters of the Railwaymen's Union, which had been requisitioned, were returned to the previous committee. It remains to be seen whether any strong measures, such as mass dismissals of superfluous staff, will be taken to improve the situation as a whole.

Before handing over the Transport Secretariat to his successor, Eng. Manuel F. Castello, Eng. Alberto Costantini held a Press conference at which he outlined at length the chaotic situation of the different systems of transport. As to the railways, he reiterated facts and figures which had been published on more than one occasion in the last six months. In addition, he pointed out that only half the cereal harvest was not transported by rail, instead of the latter having a virtual monopoly ; the same tendency, even more accentuated, had affected the wine traffic from the Cuyo Provinces. Passenger journeys had increased from 150 million in 1935 to 617 million in 1958, of which 555 million were in respect of the Buenos Aires urban and sub-urban areas, where increased facilities had not been made available. Argentina, he added, had the lowest index of railway productivity in the world, wages and salaries accounting for nearly 70 per cent of receipts, compared with 64 in the U.S.A. and Sweden, 62 in West Germany, 55 in Italy, 54 in France, 52 in South Africa, and 48 per cent in Japan. The renewals plan would call for an expenditure of 50,000 million pesos and 1,000 million U.S.A dollars over the next 10 years.

LETTERS TO THE EDITOR

(*The Editor is not responsible for opinions of Correspondents*)

Branch Line Passenger Services

September 7

SIR,—Thank you for reviewing in your September 4 issue my paper on " Rural Transport " to the Rural District Councils' Association. It seems that I have failed to make two points clear; may I now do so?

The possible value of a branch as a feeder is always one of the first points examined when the service over the branch line is considered, together with the alternatives which will still be available for through passengers. In these days of suitcases and modern road transport, the picture of a passenger being deterred by his or her piles of trunks from taking the bus to the nearest main-line station is unrealistic. I agree, of course, that anything that can be done to make sure that bus services run into the station yards of main-line stations which remain open should be done.

The " moral obligation on the nationalised railways to make vigorous attempts to provide a service " is fully appreciated; but so is the equally strong obligation not to throw away money in maintaining or developing a rail service which the great majority of passengers have chosen to desert because modern road vehicles do the particular job better and much more cheaply. The natural road unit is the single vehicle; the natural rail unit is the train; and it is when we remember that simple fact that we see clearly the respective and complementary functions of the two.

I entirely agree with your last paragraph that the closure of a line to passenger or goods traffic should be offset by vigorous commercial activity to encourage the use of the railway at the nearest suitable point and to show the improved railway facilities which continue to exist, and which are frequently improved by closing small stations on main lines and accelerating the throughout service.

Yours faithfully,

M. A. CAMERON

45, Chiltern Court, N.W.1

[Travel by bus to and from railway stations is the subject of an editorial note this week.—ED., *R.G.*]

Capital Expenditure on British Railways

September 16

SIR,—Under the title " British Railways—Their Re-emergence", Sir Philip Warter contributed an article to the *National Provincial Bank Review*, which you summarised in your September 11 issue. In commenting on the nationalisation of our railways in 1948, he writes that " for 30 years the various companies had been unable to undertake any large scheme of modernisation or even to maintain adequate programmes of replacement." Evidently he assumes that the railways were derelict in 1939 as he adds that " during the war the overworking of assets merely accentuated the problem."

Actually when the second war came the railways were " better equipped, better manned and in a better state of readiness than ever before," as Sir Ronald Matthews, Chairman of the Railway Companies Association, told Lord Leathers and the rest of the company assembled to celebrate the twenty-first anniversary of " grouping " in December, 1943. In reply, the Minister of War Transport said that the railways were moving half as much traffic as they did before the war, with depleted staffs and without additional rolling stock, proving " how well the railways were maintained in a state of readiness in the rather inglorious interlude between the wars." It was the abnormal wear and tear, inevitable in wartime, that deteriorated railway assets.

The facts in regard to capital expenditure can be stated briefly. Between 1923 and 1930, despite the 1926 strikes, the four main-line companies raised £17,000,000 of new capital. After 1930 only £8,000,000 of capital was created, but at the end of 1938, capital expenditure was about £82,000,000 in excess of receipts, largely as the result of negotiations with the Government.

The Finance Act of 1929 remitted the railway passenger duty in return for the railways taking in hand development schemes costing £6,600,000. In the same year the Development (Loans, Guarantees & Grants) Act assured the companies of interest on the capital spent in carrying out extensions, which would provide work for some of the unemployed labour. For the same purpose the Railways Agreement Act, 1935, authorised the Railway Finance Corporation to lend £27,000,000, at 2½ per cent interest, to finance a fresh programme of works.

These measures invigorated the railways and the three years, 1935 to 1937, were one of the brightest periods in their existence.

Yours faithfully,

R. BELL

Clacton-on-Sea

Passenger Movement by Road & Rail

September 17

SIR,—The editorial article in your September 11 issue on the report " London Transport in 1958," will have proved of great interest to many of your readers.

An official report issued earlier this year set out some valuable figures in respect of the comparative potential capacities of a two-track rapid transit facility and an eight-lane expressway, such as now exists in the case of the Congress Street subway route at Chicago, the western section of which is in practice, on the surface and flanked by the eight-lane highway. A count in November, 1958, in both morning and evening rush hours showed the following figures:

	Subway passengers	Automobile passengers
a.m. rush hour	9,345	7,506
p.m. „ „	10,190	6,237

Thus the Chicago Transit Authority carried more people on one track than did the four saturated lanes of automobile traffic moving in the same direction.

Yours faithfully,

C. E. R. SHERRINGTON

Byways, 20, Queens Road,
Belmont, Surrey

THE SCRAP HEAP

No Charge for Lost Property

The Victorian Railways has announced that travellers who leave articles in trains or on stations will not be charged for freight, inquiries, or telephone calls (except postal) made by the Department in helping them recover their property. If lost articles are claimed within one day of their recovery, no storage charges will be made either.

Eternal Triangle

There was a black cat of Earl's Court,
Who decided she'd never be caught,
So she lives amid danger,
And nothing can change her
For she strolls by live lines without thought.

Yes, that's the poetically independent life of Minnie the Moocher, the pride of the Cromwell Curve. Every day when the weather is fine thousands of London Transport passengers on the Circle and District lines see Minnie. She's a large black cat with a white " apron," mooching about on a triangle of land outside Earl's Court Station. She has lived there safely for 13 years, surrounded by a maze of 600-V. live lines. She sleeps in a comfortable box in a maintenance building. . . . She seems to be well aware of the danger of crossing the lines. But railwaymen think she sometimes goes up the railwaymen's steel steps to Cromwell Road. No other cats have ever been seen in Minnie's private domain, passed by over 1,000 trains a day. But she must have her own private routes to meet her husbands. She has had nearly 70 kittens.—*From " The Evening News."*

New Pullman Coat of Arms

The redesigned coat of arms of the Pullman Car Co. Ltd., is being adopted throughout the company's service on British Railways. It will be seen in the near future on cars turned out by the Pullman Car Company works at Preston Park, Brighton. The main design is in a bronze colour. The quarterings carry the same background colours as in the former coat of arms. The word " Pullman " (on the scroll) is on a red background. The lions can be compared with the lion supporters in the British Transport Commission armorial bearings.

Tidy Travellers in U.S.S.R.

The famous Undergrounds of Moscow and Leningrad are amazing. . . . No paper on the floor. Before arriving at a station the lights on the train are dimmed for a quarter-of-a-second to warn the absent-minded. After the train has left the station a voice tells them the next one. . . . People are packed like sardines in these trains, but nobody is allowed to smoke anywhere, trains or platforms, and you do not see dustbins even. Therefore it is " take your litter home," for the cleanliness is amazing.—*From " The Guardian."*

Depreciation in Value

In Belgium, as in England, there are periodical auction sales of objects left in the railway carriages and unclaimed. The list of goods to be sold, just published in the Brussels papers, contains, among other things, " a bouquet of natural flowers," " a sample of corn," and " a loaf of bread." This is indeed high testimony to the integrity of the Belgian State Railway officials, but we should imagine that after several months' storage in the lost property office these items must have lost a good deal of their pristine value.—*From " The Financial Times " of August* 1, 1899.

On the Footplate

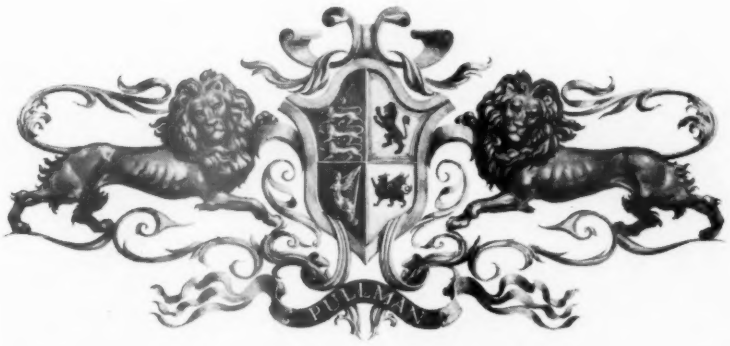
The fascinating thing about a steam engine is how tangled up the driver is among the works. There you are, in your open cab, behind you a tender full of coal and in front of you what is, after all, a sort of old-fashioned kitchen grate, with a giant clothes boiler on top of it. There are no neat little buttons to press or polished plastic knobs to turn, as in a car or aeroplane. To control the steam you grasp a gigantic lever like a crowbar; to speed up you turn a wheel like mad; and when you want to blow the whistle, you hang on to a sort of dog-leash (that would fit a Great Dane) hung above your head . . . . You cannot learn to drive a fast express as easily as you can get past your road licence test. Above all, it is extremely difficult to look out. When you are used to car windows, with windscreen wipers, it is a shock to go careering along at 80 to 90 m.p.h. with the only thing to see through a tiny porthole on one side of a huge boiler. I am sure that all engine drivers have a permanent slope to their shoulders through perpetually leaning out of their cabs to see what is ahead.—*Wynford Vaughan Thomas in a B.B.C. broadcast.*

Lunik " Rocket " for British Railways

For years the Chalk Farm Residents' Association has complained about smoke and noise of steam locomotives at the Camden depot. Now the Secretary, Mr. S. A. Edmonds, says that residents who gathered on Primrose Hill to see the Russian rocket's sodium flare were foiled by British Railways. Just as zero hour approached, he says, " a great cloud of smoke and grit billowed up from the depot and rolled across the hill."—*From the " Evening Standard."*

Schoolrooms on Wheels

Pupils from three Stirlingshire Schools have received instruction in the British Railways, Scottish Region, television train. The headmaster of Whitecross School, near Falkirk, promoted the idea and pupils from neighbouring schools at Polmont, California, and Drambowie joined the train. The outing was to St. Andrews. The train left from Manuel Station at 10.10 a.m. The route was via Linlithgow, Dalmeny, and across the Forth Bridge to Burntisland and Kirkcaldy, and then along the historic Fifeshire coast. During the outward journey a commentary was given by the teachers on the geographical and historical features of the countryside. On the return journey an impromptu concert was given by pupils over the closed-circuit TV. Members of the Stirlingshire Education Committee accompanied the party to gain first-hand knowledge of the possibilities of this educational method.



New coat of arms of the Pullman Car Co. Ltd.

A Footplate Man's Lament

It's the end, I'm told, and steam is done
Railways electrics and diesels will run;
But steam-driven *Queens* still cross the foam
And cause me to wonder as I sit at home.
With scorn the TV fans refer
To " steam " radio as inferior
Nor for an instant realise
That T.V.'s power from steam derives!
We're told the future's with nuclear power;
O'er the land new stations C.E.A. will shower.
But behind all the fuss and publicity scream
One finds that reliable workhorse—steam !

G.E.M.W.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

NEW ZEALAND

Railways' Part in Rural Development

The differential rating system operated by the New Zealand Railways had done more than anything else, excepting the energy and initiative of the farmers concerned, to help develop the back country, according to Mr. W. S. Goosman, a former Minister of Railways, in an address to the members of Federated Farmers. Mr. Goosman said that the differential rating system allowed bulky cheap goods to be carried at a cheap rate so that people could afford to buy them. It would be disastrous to the farming community if the system were abolished.

VICTORIA

Bogie Pallet Vans

A prototype covered bogie wagon for palletised traffic was tested recently in general service conditions with a view to production at Newport Workshops. It is planned to begin production in October, and construct three of the vans fortnightly. Underframes and bogies would be built at Ballarat Workshops, and the remaining components and assembly work at Newport. The two wide double doors on each side of the vehicle can admit a fork-lift truck.

Melbourne Underground Approved

The State Parliamentary Liberal and Country Party has approved in principle the design for a £25,000,000 underground railway for Melbourne. Approval has also been given for a proposal to finance the project under which two-fifths of the cost will be raised by a special siting rate on city properties in the area affected. The remaining three-fifths will be provided by special Government allocations and normal railway loan provisions. A special authority will be set up to handle the finance for the project.

The approved plan provides for the underground line to leave the existing trackage at Spencer Street. It will run beneath Latrobe Street in an easterly direction as far as Spring Street where it will curve southwards and run under the State Public Offices and the Treasury Gardens to link with the suburban network approximately midway between Flinders Street and Richmond.

Standard-Gauge Construction

Sir Arthur Warner, Minister of Transport, stated recently that the Melbourne-Albury £10,750,000 standard-gauge project was going ahead according to plan, and if the present rate of progress was maintained the through service to Sydney should begin towards the end of 1961.

Good progress is being made towards the completion of bridges and culverts, and earthworks are also well advanced. One of the major bridges to reach the final stages of construction is that spanning the Seven Creek at Euroa. Plate laying will start as soon as supplies of ballast come to hand. Maximum permissible speeds on the line will be 80 m.p.h. C.T.C. will be used to control points and signals for 15 crossing loops on the single line.

Four new trains are proposed and design plans and specifications are being prepared by New South Wales engineers in close collaboration with Victorian Railways engineers. Two of the night trains will run daily in each direction. One will cater for travellers requiring sleeping accommodation, and the other for sitting passengers. Daylight trains will also run daily in each direction between Sydney and Melbourne. This service will be operated with the existing two air-conditioned daylight trains of the N.S.W. Railways. Hauled by diesel-electric locomotives, trains operating the through service should complete the inter-capital journey within 13 hr.

Tank Engines for Diesel Locomotives

Reconditioned engines of General Grant tanks, used in the 1939-45 war, are now supplying the motive power for two diesel - hydraulic locomotives on shunting work in the Newport Workshops yard.

The locomotives, known as the "M" Class, were designed by Victorian Railways engineers and built at Newport Workshops. They are the first locomotives of their type to be introduced on the V.R. system. The wheels, axles, and undergear are identical with the Class "F" diesel-electric locomotives built by the English Electric Co. Ltd. By using the tank engines, £1,000 was saved in building each locomotive.

The engines come from two of six tanks purchased some years ago by the Railways. Parts from the other four engines have been used for maintenance purposes.

Coburg-Fawkner Doubling Opened

The new duplicated track from Coburg to Fawkner was brought into use recently. The double track is essential for the operation of trains to the new plant of the Ford Motor Co. of Australia Pty. Ltd., near North Campbellfield.

The line has been electrified from Fawkner to North Campbellfield, and reconditioned as far as Somerton. An island platform has been erected at Batman and Morlynston, and another platform provided at North Campbellfield, adjacent to the Ford Company works. The company's private siding has been provided with track connections to link it with the main north-eastern line. Flashing light signals have been installed at the Fawkner Cemetery entrance level crossing, and have also replaced the former wig-wag signal at Bakers Road level crossing.

INDIA

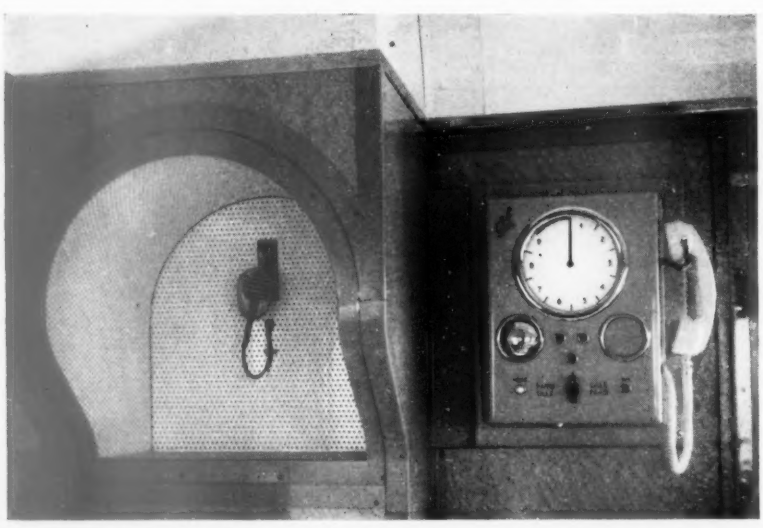
Training Station Announcers

Announcers on station public address systems are to be trained by All India Radio to ensure better delivery. The announcements include not only information on train arrivals and departures, but messages to passengers calculated to develop civic consciousness.

Marshalling Yard Extensions

The Railway Board has sanctioned a scheme for the provision of a subsidiary marshalling yard at Narayanpur Anant on the North Eastern Railway, three

Radio Telephone in Paris-Lille Trains



Radio-telephone installation, right, with intercom for calling passengers to phone, left, in Paris-Lille trains, S.N.C.F. (see our issue of March 27)

miles from Muzaffarpur.

The existing facilities in the railway yard at Muzaffarpur have been found inadequate to cope with the growing Second Plan traffic. Because of lack of space in the Muzaffarpur yard, it has been decided to provide additional facilities at Narayanpur Anant, a station adjacent to Muzaffarpur, about three miles away towards Samastipur. The scheme is likely to cost about Rs. 900,000. The Railway Board has also approved the provision of additional facilities in the railway yard at Kanpur-Anwarganj, on the North Eastern Railway, at a cost of some Rs. 500,000.

Visit by International Bank Team

The two-member team deputed by the International Bank for Reconstruction & Development to study railway projects in India met the Railway Board recently at the conclusion of a tour of the country. They met General Managers and senior officers of several railways. During a fortnight's tour, they visited the Chittaranjan Locomotive Works, the Integral Coach Factory at Bangalore, a number of other railway installations and works, and the Bhilai and Rourkela steel projects.

CEYLON

Colombo Suburban Diesel Service

A new timetable is being introduced for the operation of a more intensive suburban service in Colombo, using 15 diesel-engine power coaches supplied earlier this year by Schindler Waggon A.G. of Pratteln, Switzerland. These power coaches will be used in conjunction with locally manufactured trailer coaches to form four-car train sets. During peak-hour traffic, two of these train sets will run coupled as eight-car trains.

New Station Designation Code

A numerical code, based upon mileage, for designating stations, in place of a three-letter code, was introduced recently by the Government Railway. The system is grouped into nine routes, each with a distinctive number ranging from 1 to 9. Each station has been assigned a four-digit code. The first digit denotes the route and the other digits the distance of the station from Colombo. For example, Nanu-Oya station has been assigned No. 1,128 as it lies on the main line, which is allotted No. 1 and is 128 miles from Colombo. The new code system is stated to ensure prompt detection of misdirected wagons and expeditious marshalling and movement of wagons to correct destination. It can also greatly facilitate computations of train mileage.

TURKEY

Concrete Sleeper Production

The State Railways have awarded contracts for construction of the first two works for producing pre-stressed concrete sleepers, Type "B.55." Thees are to be made at Afyon, the point on the system where there is the greatest concentration of sleepers to be renewed. The administration has also acquired all the rights of construction in Turkey of these sleepers in works to be built at a future date. The sleeper requirements of the Turkish Railways are at present some 600,000 units a year. Local production accounts for about one-third of this.

UNITED STATES

Baltimore & Ohio Track Maintenance

By a new system of track maintenance, since June 16 completely mechanised throughout its 5,496-miles system, the Baltimore & Ohio RR. will effect very considerable annual savings. By agreement with the Brotherhood of Maintenance of Way Employees, a pilot scheme was first tried out on the Baltimore East End Division, whereby 37 section gangs and four extra gangs were replaced by 10 section gangs and nine extra gangs. The new arrangement worked so well that it has now been extended to the entire system, with the full co-operation of the union.

The maintenance sections have been reduced in number from 852 to 199, each responsible for an average route mileage of 50 to 60 miles on main lines and 60 to 100 miles on branches. Extra mobile gangs, on the other hand, have increased in number from 81 to 204. In all, therefore, the total has been cut from 933 to 403 gangs. The rights of employees have been carefully safeguarded in the new arrangements.

To make the change possible, the B. & O.R.R. has spent $3,500,000 on 1,350 units of mechanised equipment, including 425 units of track equipment and machinery; 516 units of automotive equipment, and 409 units of wagon accessories, such as bodies, winches, hoists and flanged wheel attachments.

VENEZUELA

Caracas Underground Railway

Plans for the building of an underground railway in Caracas were recently announced by the Governor of the Federal District of Caracas. Bonds are to be issued in the near future to finance the project. The decision to go ahead with the scheme follows the appointment of a committee, headed by the Traffic Director of the Ministry of Communications, to examine and advise on the plans for building such a railway.

AUSTRIA

Luggage Lockers

At Vienna Südbahnhof the first installation of automatic baggage lockers for hand baggage has recently been brought into service. It is at the disposal of the travelling public all day, except from 12.30 to 4 a.m. Other large Austrian stations also are to offer this facility.

BELGIUM

Charleroi-Namur Electrification

Goods and passenger trains between Charleroi and Namur have been considerably accelerated as a result of electrification of this section at 3,000 V. d.c., recently completed.

Publications Received

Simple Notes on Lead and Its Uses.—A four-page brochure issued by the Lead Development Association has been revised and reprinted for students and others who seek a brief account of the mining, smelting and refining of lead and some notes on its uses. The world consumption is about 2,000,000 tons of pig lead annually and such is the demand that, broadly speaking, the only large-scale producers which have an exportable surplus are Australia and Canada. Unlike most other metals, the value of lead does not depend on one single characteristic. Its softness, malleability, density, corrosion resistance, and chemical and electrical properties all contribute to its usefulness. The brochure summarises the main uses as an unalloyed metal, when alloyed with other metals, and in the form of compounds. Copies may be obtained from the Lead Development Association, 18, Adam Street, London, W.C.2.

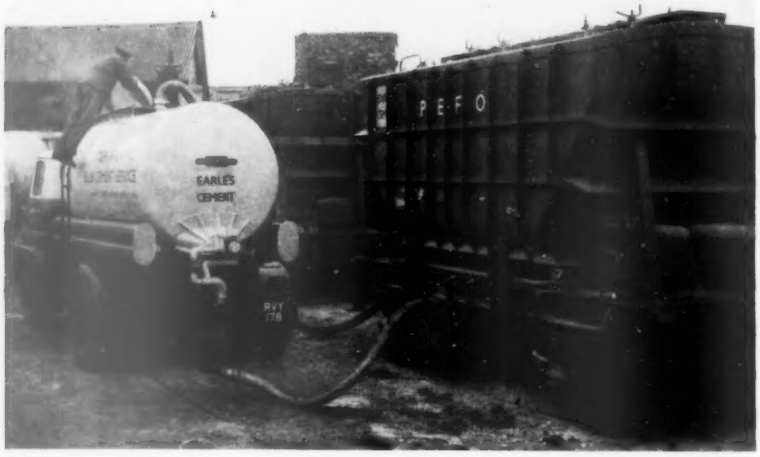
Fire-Retardant Coating.—A leaflet describing Albi-"R" fire-retardant coating has been published by Albi-Willesden Limited, 6, De Vere Gardens, London, W.8. It explains how any type of combustible building material can be decorated and protected from fire by this one coating which is applied in a similar manner to distemper, and, if exposed to fire, forms a dense insulating barrier which is stated to protect the basic material against surface spread of flame and transmission of heat, in conformation with Class "1" of B.S. 476 : 1953. The leaflet includes a chart to show the six standard colours which are available in addition to white. An illustration shows a room of a blazing timber chalet in which the occupants and furniture are protected by treatment on the inside walls. Copies may be obtained from Albi-Willesden Limited, 6, De Vere Gardens, London, W.8.

Quiz on Railroads and Railroading. Twelfth Edition. Published by the Association of American Railroads, Transportation Building, 17th and H Streets, N.W., Washington 6, D.C. No price stated. The answers in this 64 page booklet to 333 questions form a valuable corpus of information on the operations, physical characteristics, and role played by the U.S.A. railways in the national life as providers of transportation and as employers, purchasers of railway material, equipment, and rolling stock, as fields of investment, and as taxpayers. The index adds much to the value of the publication as a source of ready information. Some well-chosen photographic illustrations depict new developments and activities.

XUM

Transport of Cement in Bulk

North Eastern Region of British Railways introduces door-to-door services for this traffic



Air and cement pipes connected to Presflo wagon. Driver preparing to fit filter on manhole of road delivery vehicle

THE traditional packaging medium for the handling and movement of cement has been the multi-ply paper sack, but this is rapidly giving way to newer and quicker methods by which cement can be transported in bulk.

Contractors concerned with large-scale projects like road construction, the building of new power stations, and vast housing and factory developments, as well as suppliers of ready-mixed concrete (a material which is growing popular with the building trade), require regular supplies of large quantities of cement to be delivered loose in bulk to "batching" plants quickly and at low cost.

In 1957, to meet these requirements, and in close co-operation with the cement industry, British Railways developed a special wagon known as the "Presflo." This carries 20 tons of bulk cement and is discharged by compressed air.

The new method of bulk transport found immediate favour and, since its introduction in 1957, bulk conveyance of cement has progressively increased. There now are some 1,126 of these wagons in use and over 900 of them regularly carry bulk cement (the balance deal with flows of other bulk materials).

To complete the chain of door-to-door movement the North Eastern Region of British Railways has introduced a specialised road delivery service for cement in bulk linking with the "Presflo" rail vehicles, and thus bringing them benefits to a wider range of cement users.

Two road motors have been specially constructed and are in operation from Leeds (Marsh Lane) Railway Goods Depot over an area of some 10 miles.

The new vehicles comprise a British Motor Corporation standard 7-ton 120-in. wheelbase chassis, powered by a B.M.C. 5.1-litre diesel engine, on which is mounted a light-alloy, 210-cu. ft. all-welded cylindrical tank with dished ends, supplied and fitted by Bonallack and Sons Ltd., Basildon, Essex.

Filling and Discharge

A Wellworthy Ricardo Blower, driven by power take-off from the vehicle gear box, is used to pressurise the wagon and blow the cement into the tank of the road vehicle.

The vehicle is filled through a 4-in. dia. flexible pipe from the end of the wagon to a connection on the road vehicle leading into the top of the tank.

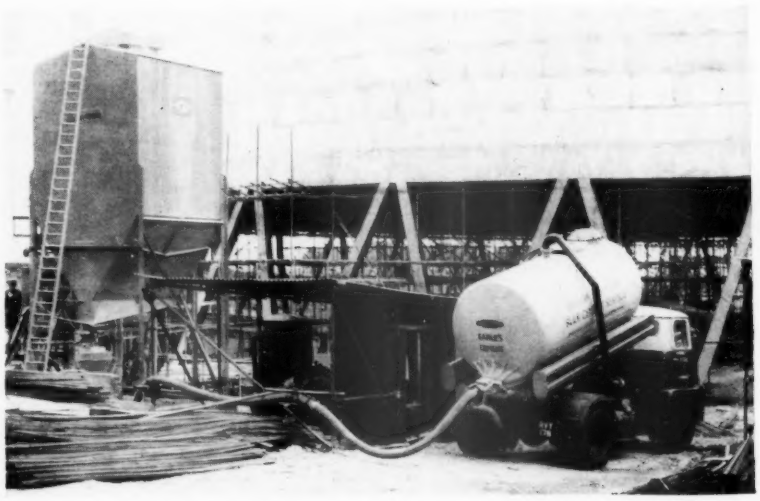
Discharge of load into silo at final reception point is accomplished by compressed air supplied through a specially-designed jet at the rear of the tank, assisted by tipping mechanism which can manipulate the tank itself. An aeration pad is incorporated in the base of the tank at the rear to encourage the cement to enter the jet stream. Blown air is fed to both aeration pad and discharge jet and controlled by the operator through gate valves.

The Wellworthy Ricardo Blower provides 300 cu. ft. of free air per min. at a maximum pressure of 12 lb. per sq. in.

Transfer Arrangements

Cement can be transferred from "Presflo" railway wagon to road vehicle at the rate of 1 ton per min. Transfer from road vehicle to final delivery point on site normally can be achieved at the same rate, although this depends on the physical conditions obtaining on the site, and in particular, on the length of piping through which the cement has to pass, and the height of the silo relative to ground level.

TRANSFER BY HAWKER SIDDELEY GROUP OF NEWLY ACQUIRED ROTATING MACHINE RANGE.—Brush Electrical Engineering Co., Ltd., a member of the Hawker Siddeley Group, recently purchased the rotating machines section of Veritys Limited, Electrical Engineers, Birmingham. The transfer to its Loughborough works of the total production relevant to this transaction has now been completed. In future all machines manufactured in accordance with Verity designs will be marketed as the Brush-Verity range. Continuity of design as regards interchangeability and spares is being arranged. All further orders and inquiries concerning Verity's electrical rotation machines should now be forwarded to Brush Electrical Engineering Co. Ltd., Loughborough, Leicestershire.



Cement being discharged from road delivery vehicle to silo at Skelton Grange Power Station, Leeds

Central Laboratory for London Transport

Improved facilities planned for scientific services to include machine for fatigue testing of railway vehicle axles

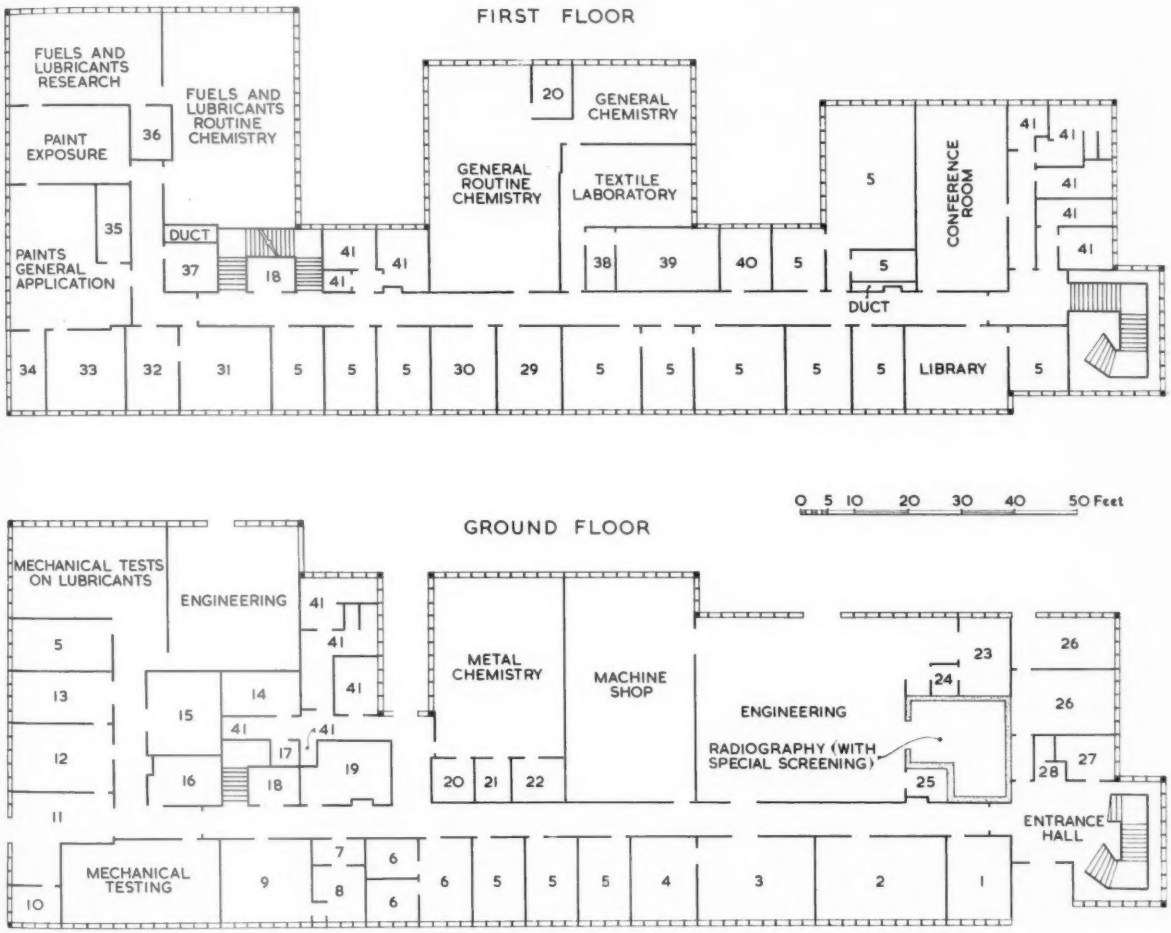
WORK has begun at Chiswick on a two-storey building to house the Central Laboratory of the London Transport Executive Research Department. It will enable the scientific staff for the first time to be under one roof instead of, as at present, in four scattered premises and three temporary huts in various parts of the Chiswick Works Estate. The new premises will have a floor area of 26,000 sq. ft. on two floors, and will give space for additional staff and for important new apparatus.

The present research department is small but highly specialised. Supplementary functions include regular routine investigations of stores and materials purchased by the Executive, and responsibility for the technical control of certain works processes. Typical of operational research by the department is a recent investigation into passenger flow in subways.

Nucleus in 1921

There has been a chemical laboratory since 1921 at Chiswick Works when the latter was first opened by the London General Omnibus Co. Ltd. Since 1931, when initial improvements were made to the accommodation, the facilities of the laboratory were increasingly sought by other departments, though until the end of 1948, control remained with the Chief Mechanical Engineer (Road Services). In that year the broadening of activities was recognised by making the laboratory provide a common service dealing direct with all departments.

The new building will bring nearly all existing activities under one roof and will give room for the installation



1 Electronics and instruments
2 Photometry and electrical
3 General physics
4 Non metal test
5 Offices
6 Microscopy
7 Dark room
8 Enlarger room
9 Photography
10 Sample store
11 Goods inward
12 Reagent preparation
13 Washing up
14 Switchgear
15 Calorifier
16 Apparatus store
17 Public telephone (under stairs)
18 Lift (15 cwt.)
19 Equipment store
20 Balance room
21 Physical analysis
22 Macroscopy
23 Cold room
24 Cold room airlock
25 Radiography control
26 Battery room
27 Waiting room
28 Enquiries
29 Special chemistry
30 Special chemistry
31 Paint chemistry
32 Paint physical tests
33 Spray application (paint)
34 Panel preparation (paint)
35 Paint store
36 Calorimeter and balance
37 Fuels and lubricants store
38 Textile store
39 Conditioning room
40 General store
41 Toilets, cloakrooms, domestic offices, meters

Ground- and first-floor plans of Central Laboratory building under construction at Chiswick

of additional equipment and for an increase in the number of scientific and technical staff to about 80 of all grades. Maximum natural light will be admitted by large windows on each side. Exceptions to complete centralisation will be the small laboratories at the three generating stations of the L.T.E. Retention of these facilities is considered essential to meet local requirements.

The first stage of the project was completed in 1957, when a small single-storey building was erected to provide accommodation for certain specialised manufacturing activities which had been carried out in a temporary hut; this building also includes a store for inflammable liquids and space for what will eventually become a pilot plant laboratory.

Related Functions Kept Together

In planning the layout of the new Central Laboratory, the principal aims have been to keep related functions together and to accommodate heavy machines and equipment on the ground floor. With this in view, the laboratory for the mechanical testing of lubricants, the machine shop, engineering laboratory, cold chamber, radiography room, battery-testing laboratories, and laboratory for mechanical testing of metals will be situated on the ground floor. On this floor, also, are to be the metal-chemistry laboratory and rooms for microscopy, non-destructuve testing, and technical photography, the latter being conveniently linked with radiography and metallography, though much general photographic work is needed additionally. The physics laboratories and photometry room, main stores, and rooms for the preparation of reagents and for the cleaning of sample bottles and glassware are, likewise, to be on the ground floor.

The upper floor will have groups of laboratories devoted to the testing of fuels and lubricants, paints and allied materials, and textiles, and for general chemical work of an exceptionally wide range. In each group, one or more small laboratories are to be provided for investigational and research work. One of the chemical laboratories has been designed to be suitable for work involving the use of radio-isotopes at a low level of activity.

Bridge Between Buildings

A bridge will connect the paint application laboatory with the roof of the first-stage building, enabling the latter to be used for weather-exposure testing of paints. The bridge will form a covered way between the two buildings. A conference room, library, and offices for the senior scientific staff and clerical services vices are to be on the upper floor where each of the specialised functions will be served by a local store.

A second paint test station on the roof of Upton Park Garage will be retained so that tests can be made under atmospheric conditions relating to East as well as West London. In addition to direct exposure to the weather, accelerated weathering tests on paints will be carried out using an existing apparatus which will be re-housed in the new laboratory. Facilities will be enhanced by the provision of a water-back paint spray booth.

An electric lift between the two floors will facilitate the transfer of stores, apparatus, and glassware. Services of gas, electricity, compressed air, and steam are to be provided on both floors, together with a pressurised water supply, it being no longer permissible to connect mains-supply water direct to laboratory benches.

Routine Technical Control

As with the present laboratory, the new Central Laboratory will be concerned with regular testing of supplies, involving both chemical and physical tests and the use of mechanical testing equipment. Technical control of works processes such as cleaning and de-greasing, metal protection, spray painting and stove enamelling, welding, heat-treatment, and heavy electro-deposition will also be continued; for these purposes the new building is sited conveniently in relation to both Acton Works and Chiswick Works, and is within easy access of the permanent way depot at Lillie Bridge. Close contact also is maintained with Aldenham Works for road vehicles, where a member of the laboratory staff concerned particularly with technical control of painting processes is always available.

Long-Term Research

An example of long-term investigations carried out is the technical research into the properties of lubricants, particularly for road vehicles. Much work has been done in connection with the design of lead-acid batteries and also in determining the stress loading of equipment such as railway vehicle axles, under service conditions.

The improved facilities to be provided will make possible more rapid progress in these investigations and will widen the scope of such work. Also it will be possible to undertake rig-testing and the testing of materials and components, both mechanical and electrical, under precisely controlled conditions.

Varied Uses for Cold Chamber

Experience with a small cold chamber, installed some three years ago in a temporary hut, revealed a latent demand for such equipment, and the better facilities which will become available in the new laboratory will further assist in the development of conductor rail de-icing fluids, in the testing of alternative methods of de-icing, and in investigating problems relating to the performance of air-operated and other mechanical and electrical equipment under low-temperature conditions.

Demands for the testing of textiles (uniform cloths and linings, weatherproof clothing, upholstery materials, and so on), have grown to a considerable extent in the existing laboratory and the provision of an air-conditioned room and additional ancillary equipment will facilitate this work. Other new equipment for textile testing will include a ballistic tear resistance apparatus, water repellancy testing equipment, and a modern type of fade resistance apparatus.

A 200kV. industrial X-ray set will be used in a specially-designed room which will be available additionally for gamma-radiography of thick steel specimens using a 5-10 curie source of cobalt 60. There will be new machines for the physical testing of metals and rubber and machine-shop facilities will be improved by both additions to and replacements for existing machine tools. Heat-treatment furnaces and welding equipment will augment existing facilities for metallurgical investigations. These items of plant will be installed in the pilot plant laboratory, which also will house a single-cylinder diesel engine for fuel testing and other purposes. The pilot plant laboratory will be available additionally for investigations into works- and garage-maintenance processes such as those involving trials with semi-scale equipment.

Among the equipment in the laboratory for mechanical testing of lubricants will be a four-ball machine for determining the load-carrying capacity of lubricants, a rolling stability grease test apparatus, a C.R.C. grease tester, and a mechanical grease worker. There will be installed an automatic oxidation apparatus applicable to both lubricating oils and greases.

Apparatus for the physical laboratories will include a 12-channel ultra-violet recording equipment of high-speed response for simultaneous strain-gauge tests and for other purposes, noise and vibration measuring equipment, and additional electrical instruments. Many new items of equipment will be provided for the chemical laboratories including visible and ultra-violet spectrophotometers, a flame photometer and an automatic titration apparatus. The large amount of modern apparatus and equipment at present in use in the various laboratories will be transferred to the new building.

Axle Steels to be Investigated

The largest item of equipment to be installed is a fatigue testing machine, capable of testing full-size railway car axles. This is being designed and constructed under an extramural research contract at the University of Nottingham and it will be the only machine of its kind in Great Britain. The concrete base will weigh about 10 tons and will itself rest on an anti-vibration mounting independent of the foundations of the building. The machine will be used for investigations into the properties of different grades of axle steels and variations in methods of cold rolling, the objective being to effect improvements which will virtually eliminate any tendency for the development of fatigue cracks during the service life of the axles.

The new Central Laboratory has been designed to the requirements of Mr. A. T. Wilford, Director of Research, L.T.E., by Messrs. Adie, Button & Partners, Architects, under the general direction of Mr. T. R. Bilbow, Architect, L.T.E.

NORTHERN ALUMINIUM CO. LTD. The London Area Sales Office of the Northern Aluminium Co. Ltd. has moved from Bush House to new premises at 50, Eastbourne Terrace, London, W.2, telephone Paddington 3281, telegrams Noralumin London.

ELECTRIC RAILWAY TRACTION SECTION

Multiple-Unit Electric and Diesel Trains

THE " Brighton Belle," probably the best known Pullman train, is the only multiple-unit train to consist of Pullman cars only. The Pullman Car Co. Ltd., and the then Southern Railway, on introduction of third-rail electric traction between London and Brighton, placed in service three five-car multiple-unit Pullman sets. Two, or sometimes one, of these have since worked the " Brighton Belle," or " Southern Belle " as it was called until 1934. Apart from the short-lived " Golden Mountain Pullman Express " on the metre-gauge electrified M.O.B. Railway in Switzerland, British Railways are unique in adapting Pullman service to electric, and, in the near future, diesel multiple-unit trains. The construction in the 1930s of multiple-unit stock to run at high speeds over lines electrified on the third-rail system, and to afford a high degree of comfort, presented technical problems which were then unfamiliar. The " Brighton Belle," like other multiple-unit stock on the London-Brighton main line, gave rise to complaints of bad riding. Attention to suspension of the motors and to riding problems generally has resulted in a great improvement. After nearly 27 years the sets give good service between Victoria and Brighton and on other services, as between London and Eastbourne and Epsom Downs, as traffic demands. Whether the Southern, the only Region of British Railways affording fairly long hauls with third rail electrification, will afford further scope for all-Pullman electric trains, remains to be seen. The present demand for Pullman accommodation is largely from business travellers to the North and West.

The " Brighton Belle " and other all-Pullman trains, steam-hauled or diesel-hauled, on British Railways, show the close association between railways of this country and the Pullman organisation which should be remembered in the Pullman centenary year. George Mortimer Pullman's first sleeping car, rebuilt from a Chicago & Alton Railroad coach, began to run on that railway between Chicago and Bloomington 100 years ago. The date of inauguration of this service seems to have been September 1, 1859. Pullman established the principle, followed later by the International Sleeping Car Company, of an independent undertaking providing coaching stock more luxurious than that operated by the railway itself. He founded Pullman's Palace Car Company in 1867. Operation of Pullman parlour cars, prototypes of Pullman cars as known today on British Railways, spread to Britain in the 1870s. The Midland Railway was the first to run Pullmans, between St. Pancras and Leeds in 1874. The first all-Pullman train to run between London and Brighton was introduced by the London Brighton & South Coast Railway in 1881, and the " Southern Belle " began to run in 1908. The British Pullman Car Company and its subsidiary, the Drawing Room Cars Company, were founded in 1882. These concerns were bought in 1915 by the present Pullman Car Company. The ordinary share capital of the latter was bought in 1954 by the British Transport Commission. The company continues to function independently, though in close association with the British Transport Commission in matters of policy, and with the Regions of British Railways as successors to the railways on which Pullman cars were operated.

After electrification at 25 kV. a.c. of the main lines of the London Midland Region from Euston to Birmingham, Liverpool, and Manchester, there will probably be scope for all-Pullman trains between London and some large cities. The East Coast route from Kings Cross to the West Riding, and the North East, and Scotland, promises possibilities. The advantages of multiple-unit working are apparent at a busy terminus. Nor, with a fairly constant demand for services of this kind, is there any great need for the elasticity of composition of a locomotive-hauled train, as is shown in the decision to operate multiple-unit diesel trains between London and Manchester.

Diesel traction is being introduced on British Railways to some extent as an interim measure, to provide acceleration and other advantages of electric working during the necessarily long process of electrification. For the fast diesel service of the London Midland Region between St. Pancras and Manchester, the Metropolitan-Cammell Carriage & Wagon Co. Ltd. is building multiple-unit diesel-electric sets for the Pullman Car Company and British Railways. These will be followed by sets to work on other main lines, as between Paddington and Birmingham and Wolverhampton.

Railways can compete successfully for lucrative business traffic over distances of up to, say, 400 miles by running high-speed trains offering a high standard of comfort. Quick and comfortable journeys are afforded by the diesel multiple-unit expresses on the Continent, most of which are reported to be doing good business. The Pullman expresses, and indeed the single Pullman cars run in ordinary trains, on British Railways achieve a high standard of comfort. This will be surpassed in the Pullman diesel train sets now building, which will incorporate air conditioning amongst other amenities. There is scope for such trains, whether the motive power is diesel or electric, on several routes between major traffic centres in Britain.

British Railways Electrification Priorities

COMPLETION by 1964 of electrification of the Western Division main lines of British Railways, London Midland Region, at 25 kV., 50 cycles, involves concentration, as regards a.c. main-line electrification, of effort and resources on the biggest railway electrification project ever undertaken. Work will continue on a.c. electrification of London suburban lines of the former Great Eastern and London Tilbury & Southern Railways in the Eastern, and on Glasgow suburban lines of the former North British and Caledonian Railways in the Scottish Region. The Eastern Region is to convert suburban lines of the Great Northern Railway and L.T.E. Northern City lines. These, however, are individually small commitments compared with electrification of the Crewe to Manchester lines via Stockport and via Styal by September, 1960; of the Crewe to Liverpool line by September, 1961; and of the Euston-Birmingham-Crewe lines by 1964. According to the report on the reappraisal of the British Railways modernisation plan, 1964, as the date now envisaged for completion of the L.M.R. main-line scheme, is the date as accelerated, and subject to review. Besides these overhead electrifications, work has begun on conversion on the third rail system of the Southern Region main line from Sevenoaks to Dover and Ramsgate via Ashford, and some associated sections, and is due for completion in 1961-62. The revised electrification programme requires that electrification should be completed on some 600 route miles during 1959-63, and that work should be in progress on about a further 600-700 route miles at the end of that period. The immensity of the task may not be apparent from this. The amount of four trackage and sidings is very great compared with anything in other countries, except perhaps on the electrified sections of the Pennsylvania Railroad. There are many tunnels and overline bridges which will necessitate much work to obtain clearances for the overhead equipment. Nor is there much time left for alteration of plans consequent on study of the a.c. electrifications now in action in Britain.

Because of the concentration of effort on the L.M. Region electrification, conversion of the Eastern and North Eastern main lines from Kings Cross via Doncaster to Leeds and York has had to be postponed to after 1964. This was inevitable in view of the magnitude of the demands of the schemes in hand, for financial, material, and manpower resources. It would have been folly to prejudice the success of two major projects through dissipation of effort. There is also the disruption of services inevitable in the virtual recreation of a main-line railway. Sir Philip Warter, Member of the British Transport Commission and Chairman of the Southern Area Board, recently pointed out that a limit must be set to the amount of disruption that can be tolerated, even supposing that the electrical industry in this country could meet a vastly stepped-up demand for the mass of equipment required for electrification. Meanwhile diesel traction is being used as an interim measure to give good services on lines to be electrified.

XUM

Electric Traction Section

Extension of Ilford Electric Train Depot

Facilities for the maintenance and cleaning of electric trains

Interior of shed, showing precast concrete floor planks and extensive roof glazing

WHEN the electrification of the Liverpool Street suburban lines and the London, Tilbury & Southend line is completed, facilities will be required for the maintenance, cleaning, and periodic overhaul of the greatly increased number of multiple-unit electric trains which will then be in service in the London area. With this in mind the Eastern Region of British Railways has extended the existing electric train depot at Ilford.

The main feature of the enlarged depot is the new combined inspection and cleaning shed, 656 ft. long and 257 ft. wide, containing 16 tracks, each with an inspection pit 616 ft. long. A new two-storey block for offices and staff accommodation has also been built. The existing inspection shed and repair shop will now deal with the periodic overhaul and heavy repair of multiple-unit electric rolling stock.

Inspection and Cleaning Shed

The new shed has been designed for the inspection and cleaning of electric trains, and the operations to be carried out include interior and exterior cleaning, including vacuum cleaning of upholstery and solution cleaning of windows; renewal of brake blocks; and light repairs and adjustments to underslung equipment.

These four basic operations dictated the design of the shed and required the concrete in the floor to be dense enough to resist the penetration of the acid cleaning solution; the provision of hot and cold water and vacuum service; accommodation trenches adjacent to the rails into which the brake blocks could be deposited from a Lister truck and two trailers; and the provision of compressed air and 50-V. electric supply for power tools. Consideration has been given to the movement in the aisles of coach cleaning trolleys and the turning circle of a Lister truck and two trailers when proceeding from one aisle into another.

Because of the number of services and connecting points to be provided, and the small amount of space left between the pits for vehicles to load up and cart away excavated materials, it was decided to take out a basin of excavation over almost the entire area of the site to approximately the level of the underside of the inspection pit base slabs. This was carried out by scrapers and completed in four weeks. The spaces between the pits were then bridged by prestressed concrete planks forming the floor of the shed, and creating tunnels for the accommodation of the services which were mounted on the pit walls.

It is expected that the high grade of concrete in the prestressed concrete planks will solve the problem of acid penetration.

Overhead Line Equipment

The overhead line equipment supplying electricity to the trains is carried throughout the length of the shed over each of the 16 tracks. The equipment is anchored at each end by specially designed catenary anchorage girders which withstand a horizontal force of 2¼ tons from each wire. The contact wires are supported intermediately by tubes which also act as sheathes for the cable controls to ventilators in the roof glazing.

It may be necessary from time to time during daylight hours to lower the train pantographs from the contact wires for light repairs, and in this event the train lights would be extinguished. A system of roof glazing was therefore required which would give enough natural light for the train cleaners to continue their duties inside the trains. The glazing was sited over the aisles between trains where it would give the maximum benefit. With this system, a daylight factor of 8½ per cent at a height of 3 ft. above floor level was achieved and the proportion of the roof area glazed was 58 per cent. With such a high percentage, special attention was given to ventilation to reduce the temperature rise within the shed during summer conditions when the penetration of solar heat through the glass would be at a maximum.

The roof and wall cladding is of aluminium with a fire resistant wall board lining. In the case of the roof, this has been covered with three layers of bituminous felt topped by granite chipping for which a guarantee of 25 years has been given. Painting should not be required but a fairly good appearance should be maintained. The reduction in weight to be carried by the roof structure assists in keeping the sizes of members to a minimum, together with the spacing of columns to a maximum consistent with economy.

Pretensioned, precast concrete was selected for the columns and roof beams, and erection was completed in nine working weeks. The interior spans of the latter measure 62 ft. 4 in. These beams may be used in any shed covering four tracks. Pretensioned concrete columns

were possible as a large proportion of the forces to be resisted were due to wind; these proved cheaper than reinforced concrete columns.

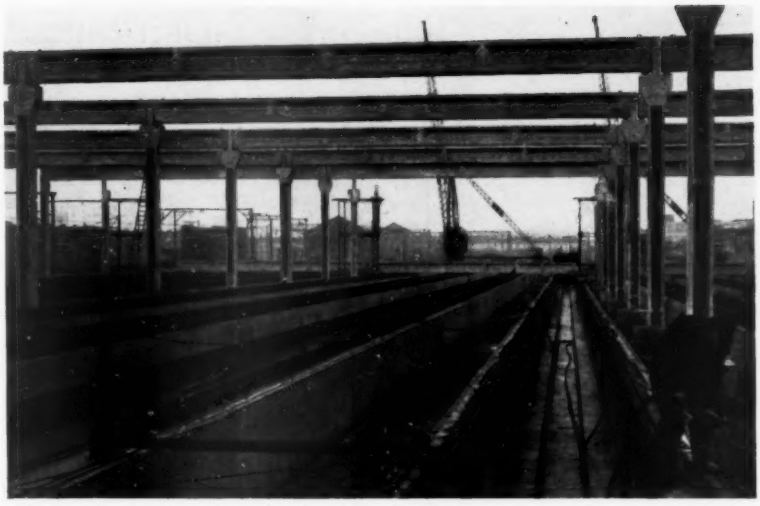
Offices and Staff Building

The main ancillary accommodation for the new depot is sited to the south of the carriage shed and consists of a two-storey building 170 ft. by 27 ft. with a single-storey building linking it to the shed. To the east of these buildings is a cycle store and boiler house, while to the north of the shed is a garage and petrol store.

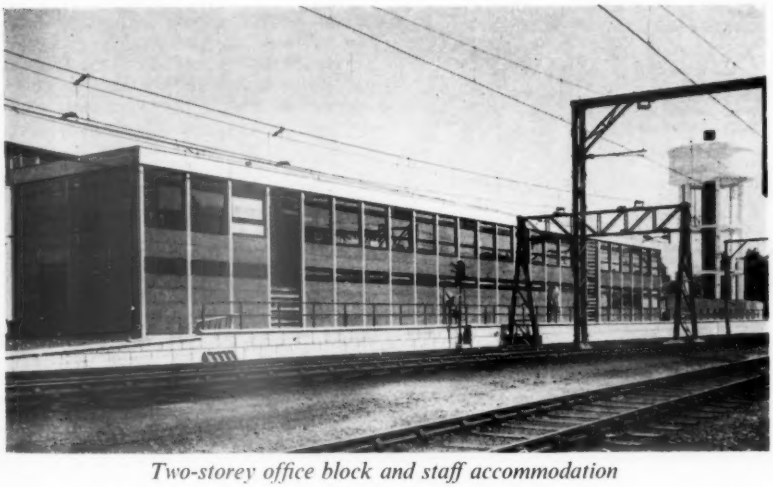
The two-storey building provides offices, stores, and lavatory accommodation on the ground floor and messrooms, kitchens and locker rooms on the first floor. Male and female staff have separate access to their accommodation with duplicate facilities. Because the proportion of men to women is liable to fluctuation at the depot, provision has been made in the central messing area for varying the size of accommodation by a movable screen.

Precast Concrete Construction

This building is an "Intergrid Mark II" structure in precast prestressed concrete. The external infill panels are concrete with an exposed aggregate finish, and are backed by a continuous pressed metal screen housing the heating units. Windows are in hardwood and are horizontally pivoted. Internal cross walls are lignacite block and between these hardwood frames are infilled with notice boards, hatches, and glazed panels above infill panels of 1 in. cork faced with ribbed aluminium. The internal finishes generally have been selected to be hard wearing and easily cleaned. Walls to lavatories, messroom, and on main lines of circulation are faced in white or yellow glazed tiles, and floors are either quarry or concrete tiles. The ceilings are suspended with a slotted acoustic board finish to offset the large areas of sound reflecting surface.



Shed under construction, showing tunnels adjacent to pits for accommodation of electric and compressed air services



Two-storey office block and staff accommodation

The single-storey link building accommodates supervisory staff, workshops, and a bay with overhead crane for the removal of train pantographs for repair. The building is a cross wall structure in sand line bricks, with a metal deck roof. Floors are quarry tile on granolithic paving, and the walls and ceilings are painted.

Oil-fired Heating

In the boiler house there is an oil-fired boiler which provides central heating and hot water to the staff accommodation and hot water for carriage cleaning in the shed; it also houses compressed air plant and high and low tension electrical switch gear. The structure is similar to that of the link building. Infill panels between the cross walls are made of hardwood and are removable to facilitate replacement of machinery.

The boiler flues are combined in a single reinforced concrete structure. They were raised simultaneously utilising the same scaffolding.

The work was designed and carried out under the direction of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region, and the ancillary buildings were the responsibility of Mr. H. H. Powell, Regional Architect. The general contractor was W. & C. French, Limited, Buckhurst Hill, Essex.

NEW ADDRESS FOR B.I.C.C. NORTHAMPTON DEPOT.—British Insulated Callender's Cables Limited has announced that from September 28, the address of its Northampton Depot will be 18/22, St. George's Street, Northampton. The telephone number, Northampton 1860, is unchanged.

THE TALYLLYN SCENIC DIESEL RAIL TOUR.—The Talyllyn scenic diesel rail tour, organised by the Railway Correspondence & Travel Society, was held on September 6. The train left Leeds City South at 9.30 a.m. travelling by way of Huddersfield, Manchester, Warrington, Chester, Gobowen, Oswestry, Moat Lane, Machynlleth, Aberdovey, Towyn, Abergynolwyn, Barmouth Junction, Dolgelley, Corwen, Ruabon, Chester, Warrington, Manchester, and Huddersfield, arriving at Leeds at 10.11 p.m.

STREAM-LINE FILTERS TO BE EXHIBITED.—At the International Motor Show in London, on October 21-31, Stream-Line Filters Limited will feature the Micro-Pak, a new by-pass lubricating oil filter for detergent and multi-grade oils. This is for the removal of ultra-fine peptised carbonaceous matter which cannot be removed economically by a full-flow filter. A comprehensive range of purifiers for the fine filtration of oil also will be shown, including plant to filter batches of detergent oil, with the same standard of results associated with straight oils. The company has changed its address to Henley Park, Normandy, near Guildford, Surrey. Telephone, Normandy 3311.

RAILWAY CONVALESCENT HOMES.—The income of the Railway Convalescent Homes during the year ended December 31, 1958, was £165,070 and expenditure of £166,172. Railway staff contributions, gifts from the public, and so on, totalled £154,522 or £1,237 less than in 1957.

Electric Traction Section

Russian Multiple-Unit Suburban Trains

Experimental design almost identical for motor and trailer cars: drive by cardan shaft and spur gears from fully-sprung motors

(By a correspondent)

THE rapid electrification progress of the Russian railways made it necessary to develop new multiple-unit rolling stock for use in the suburban services round Moscow, Leningrad, and Kharkov. To meet the requirements for improved overall performance five experimental trains were put into service during 1957. The mechanical parts of these were built by the Riga Carriage Works, while the electrical equipment was supplied jointly by Riga Electrical Machinery Works and the Dynamo (Kirov) Works at Moscow. The trains are designated ER.1 ("Electrotrain Riga First") and series production of these began during the second half of 1958[1]. Each train consists of 10 cars: two driving trailers, five motor coaches, and three intermediate trailers (Fig.1). It is possible to make up trains of four, six, or eight vehicles, half of which are motor units.

The trains were designed to ensure an average acceleration of up to about 2·13 ft. per sec.^{2} up to 37·5 m.p.h. The maximum speed is limited to about 80 m.p.h. The acceleration will be gathered from Fig. 2 for the different positions of the master controller handle. Position S refers to shunting. In some 1·6 miles between stations the train can attain about 60 m.p.h. compared with 69 m.p.h. for three miles. Electro-pneumatic brakes with a brake ratio of 170 per cent and inertia deceleration control ensure high values of retardation, which reach 3 ft. per sec.^{2}. The specific current consumption is plotted for two values of distances between stations in Fig. 3. The average speed between the stops at these distances is 34 and 44·5 m.p.h., respectively, while the current consumption is 88 and 56 W.hr./ton–mile respectively. As will be seen from Fig. 2, the controller has five positions. The corresponding road speeds of the fully laden train are summarised in the following table:—

SPEED OF TRAIN ER.1 IN M.P.H.

Controller position	Speed after 2 min. m.p.h.	Balanced speed in the level. m.p.h.
S	25-28	31
1	31-34	37·5
2	37·5-40·5	44
3	56-59	65
4	66-69	81

The main dimensions and other data relating to the 10-coach train are summarised below:—

General Data		
Voltage		3,000 d.c.
Power output		4,000 kW.
Seats		1,056
Total passengers, normal		1,790
		ton
Tare weight		450
Train weight, laden		575
	ft.	in.
Train length	675	0
Coach length (headstocks)	64	3
Inside length	52	0
Width, outside	11	5
Width, inside	10	10
Height overall	14	0
Height inside	9	0
Floor height	4	7
Bogie pitch	43	8½
Motor Coach		
No. of motors	4	
Output 1 hr.	800 kW.	
Output continuous	640 kW.	
Field weakening, per cent	50	
Gear ratio	73/23	
Seats	110	
Normal capacity	185	
	ton	
Tare weight	52·5	
Body weight	24·5	
Bogie weight (two) each	14	
Weight of electrica equipment (total)	11·54	
Motors	8·8	
Auxiliaries	0·04	
Control gear, etc.	2·7	
	ft.	
Bogie wheelbase	8·5	
Wheel dia.	3·44	
Trailers		
Seats	88/110	
Normal capacity	155/185	
	ton	
Body weight	24·5/22·9	
Bogies (two) each	7	
Tare weight	38·5/36·9	
Weight of electrical equipment	2·27/2·17	
Aux. and battery	1·82	
Control gear, etc.	0·45/0·35	
	ft.	
Bogie wheelbase	7·9	
Wheel diameter	3·44	

The first values above relate to the driving trailer.

Body Construction

The coach bodies are of all-welded construction designed as a single shell. Use is made of floor, side, and roof members to ensure the necessary resistance at a relatively low weight. An almost identical design was evolved for motor and trailer cars, the actual body structures weighing 11·3 and 10·8 tons respectively. The welded body frame (Fig. 4) consists of pressed buffer beams 1, welded box-section main cross-beams 2, main longitudinals 3, using Z-section members, joists 4, and short welded beams 5, designed to take the automatic couplers. The underframe is covered by 1·5 mm. thick corrugated plates which ensure appreciable rigidity. The cross-section through the body (Fig. 5) shows the simple yet strong structure utilising 2 mm. steel sheets above the windows, while 2·5 mm. sheets are used between and below the windows. The lower sheets are provided with three longitudinal grooves. The vertical columns at each side of the door opening are substantial box sections. The end walls are covered by 2 mm. sheets. The front end of the driving trailer is stream-styled and the lower part is covered by 2·5 mm. sheets, while 1·5 mm. sheets are used for the roof. Ventilating air inlet louvres for the force ventilated passenger compartments are provided over the doors. The 25 mm. wood boards for the floor are supported on the corrugated steel plates via wooden seats. The intermediate space is packed by thermal insulation, while the floor boards are covered with linoleum. The partitions in the passenger compartments adjoining the entrance platforms incorporate the ducts for the ventilating air and in the case of the power cars also those for the motor ventilation.

The double sliding entrance doors are of welded construction and are pneumatically operated from the driver's cab, there being one operating cylinder for each door half. In case of emergency the door can be opened manually after breaking a glass cover over a bleed valve push button which lets the air out from the operating cylinder. The seats are incorporating wooden frames supported by the outer wall and by metal feet at the gangway side, the seat pads being made from foam rubber and cotton wool covered by an imitation leather plastic. Double pans are used for the 3 ft. 2 in. long side windows. The inner, winter, pan is removable, while the outer pan is divided into two halves, the upper one being arranged to slide into the roof to facilitate ventilation.

The welded bogie frames utilise square section members fabricated with the aid of plates and channels for the main longitudinal and cross beams (Fig. 6). Fully elliptic bolster springs are carried by 18⅜ in. long swing links set at an

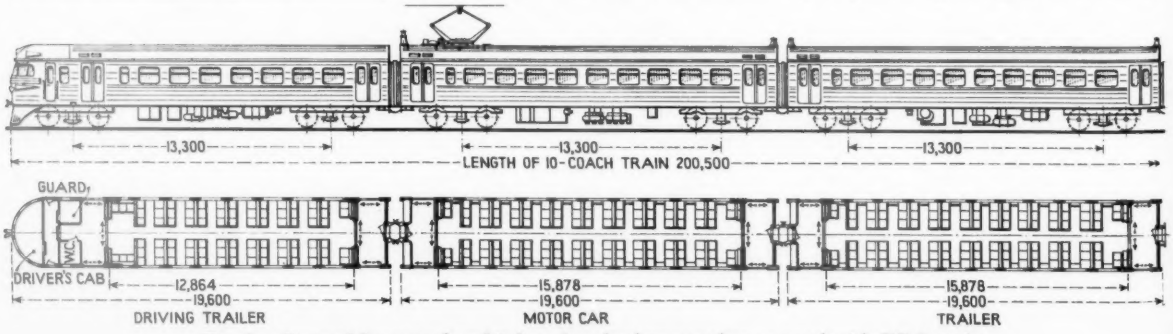


Fig. 1—General layout of multiple-unit suburban coaches as used with ER.1 trains

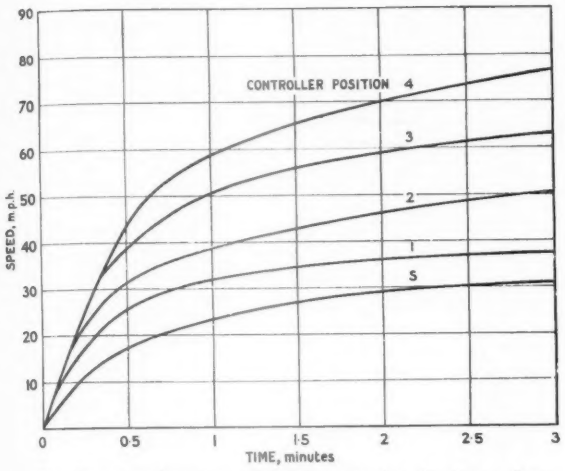


Fig. 2—Acceleration of ER.1 train (no load) as determined by the controller position

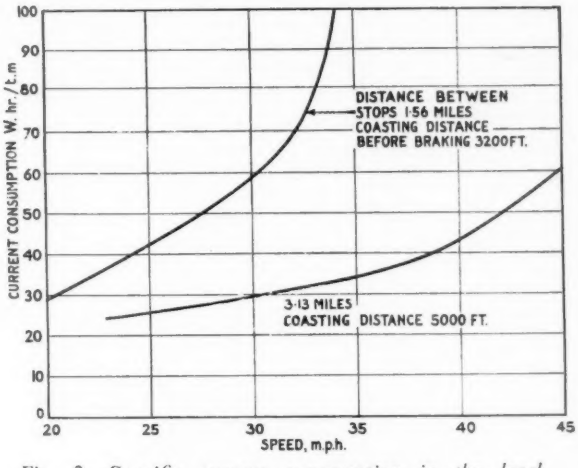


Fig. 3—Specific current consumption in the level, starting with controller in fourth position

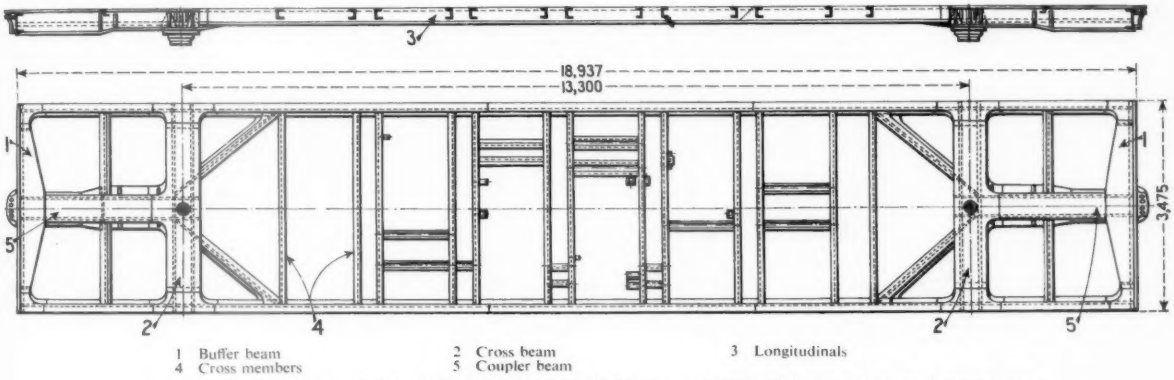


Fig. 4—Construction of the all-welded body underframe is identical for trailers and motor cars

angle of about 6 deg., this reducing the effective link length to about 14 in. The static deflection of the bolster springs under tare load is about 2·2 in. The lateral displacement of the bolster beam is limited to 1⅛ in. to each side of the centre. The axleboxes are located in the bogie frame by conventional horn guides (Fig. 7) provided with bolted cast-iron wear surfaces, while the axleboxes carry welded hardened plates. Helical springs supported by rubber pads are provided for the primary suspension ensuring a static deflection of about 1·5 in. under tare load. To facilitate bogie handling in shops or in case of derailment, the axlebox is secured in the vertical plane with the aid of a bolt passing through the bogie frame. The motors are fully sprung, being bolted to the main cross member and drive the axles via a short cardan shaft and a spur gear (Fig. 8). The design of the drive is practically identical with that developed for the Moscow Underground as previously described in this journal (2). This design permits an up and down displacement of the motor of up to 8·5 mm. relative to the axle, this limiting the amplitudes of bogie pitching and bouncing and calling for limited static deflections and deflection variations due to heavy loads likely to be encountered in suburban service.

The trailing bogies are of a similar design and the bolster and axlebox springs are identical with those used for the motor bogies. However, the axlebox location is of a very simple design (Fig. 9) somewhat resembling the layout evolved in Switzerland yet dispensing with the closely fitting cylindrical guides which are a feature with the latter vehicles. So far as the fore and aft and the lateral guidance is concerned, this relies mainly on the lateral stiffness of the helical springs (3), although the maximum displacement is limited by the conically shaped guide extending from the bogie frame, while vertical and lateral shocks are mitigated by the rubber pad inserted between the spring and the axlebox housing. The static deflection of the bolster springs under tare load is about 2·2 in., whilst that of the primary springs is about 1·2 in. These values are on the low side, particularly so far as the laminated bolster springs are concerned, which are likely to be overdamped and subjected to somewhat erratic friction forces, so that the riding qualities may be expected to be rather harsh by modern standards, particularly at higher speeds (4). This particular

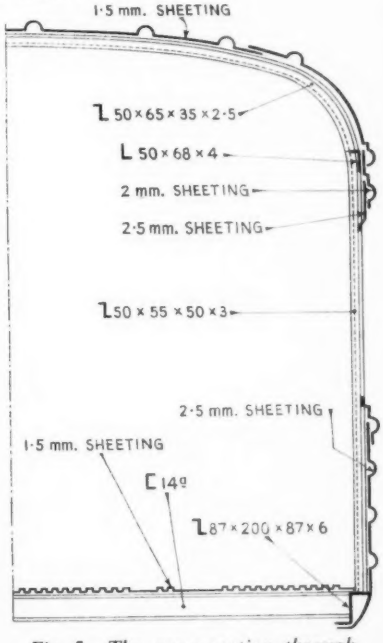


Fig. 5—The cross-section through the body structure shows wide use of corrugated sheeting

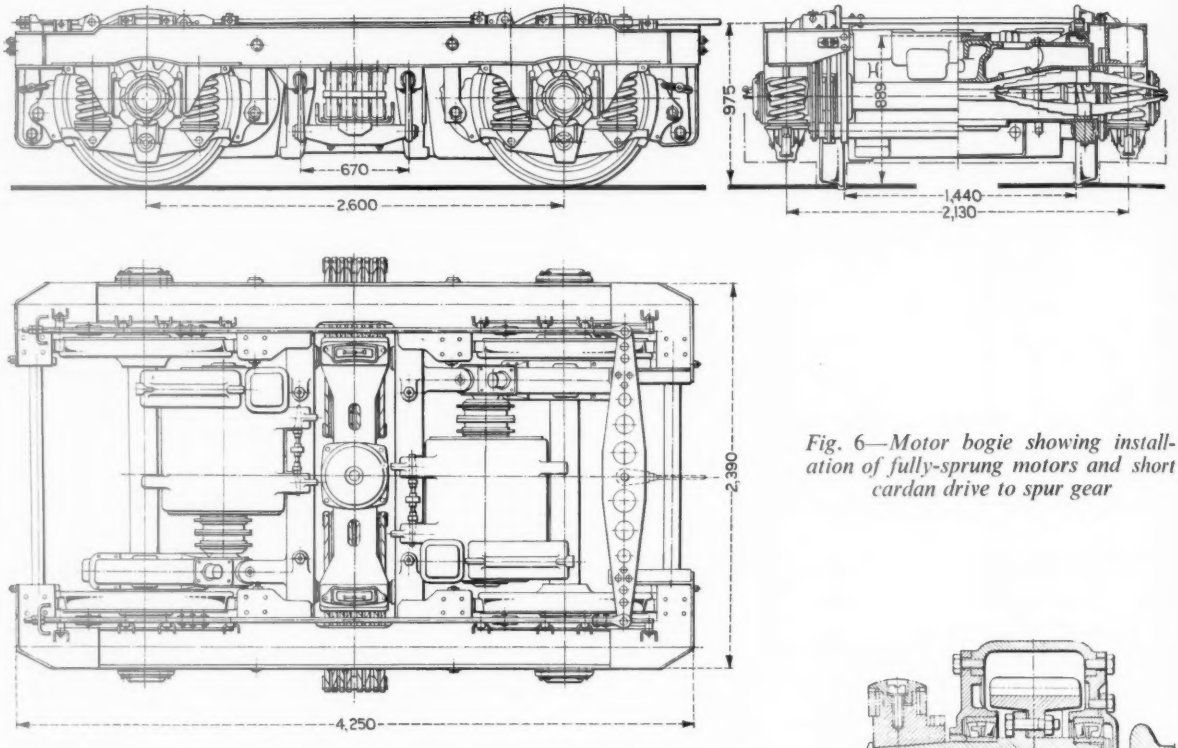


Fig. 6—Motor bogie showing installation of fully-sprung motors and short cardan drive to spur gear

axlebox design has been standardised for bogies of all recent passenger coaches.

Electrical Equipment

The self-ventilated 1,500V. motors have four main and four auxiliary poles and develop 197 kW. at 830 r.p.m. at the one hr. rating and 145 kW. at 945 r.p.m. continuously, the relevant efficiencies being 90 and 92 per cent respectively. With the field weakened to 50 per cent the power output, speed, and efficiency at one hr. and continuous output are 200/160 kW., 1,140/1,320 r.p.m. and 91·5/92·5 per cent respectively. The maximum speed is limited to 2,080 r.p.m. The overall motor length is 3 ft. 4 in., the armature is 1 ft. 8½ in. in dia. The commutator incorporates 329 segments and is 1 ft. 6¼ in. in dia. The working surface is 3⅛ in. long; the intersegment voltage is 18·2V., and the thickness of insulation is 1·2 mm. The resistance of the armature at 20°C. and 100°C. is 0·163 and 0·215 ohms, respectively, whilst that of the main poles is 0·181 and 0·239 ohms, and that of the auxiliary poles 0·0805 and 0·106 ohms. Each of the four brush-holders carries two 16 x 32 x 50 mm. brushes. The working pressure is about 4·5—5 lb.

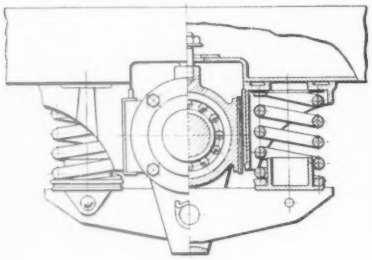


Fig. 7—Design of primary suspension for motor bogie

Each motor coach has a single pantograph capable of dealing with a current of up to 1,000 A. working at a contact pressure range of 12-19 lb., the difference between the up and down force being limited to about 6·5 lb. More recently an improved design has been introduced with which a pressure of 13-20 lb. is maintained in summer compared with 19-24 lb. in winter service. The time required to raise the pantograph is 4-7 sec., and 3·5-5 sec. to lower it. The total weight is 650 lb.

No provision is made to cut out defective motors, for with five motor coaches and 20 motors per train, it is considered permissible to cut out the complete motor car without unduly affecting the train performance. Each motor coach incorporates a high-speed cut-out switch capable of dealing with short-circuit current of up to 10,000 A. within about 0·02 sec. To ensure effective wireless-disturbance suppression, inductance-capacitance filters are incorporated in the power circuit having a magnitude of about 500 microhenrys and 1 microfarrad which deal with the arcing and sparking due to the pantograph, motor commutation, and so on.

The main camshaft controller incorporates 18 notches, 11 in series and seven in parallel, the motor field being weakened to 67 and 50 per cent at the tenth and seventeenth and twelfth and eighteenth notch, respectively. The controller is operated by a pneumatic

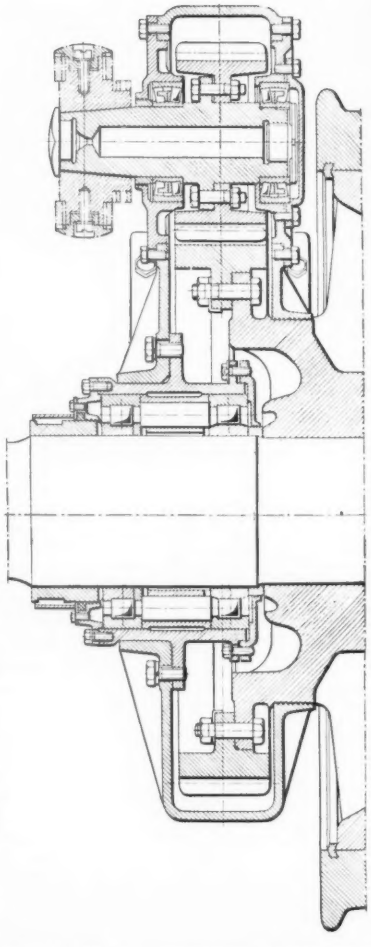


Fig. 8—The arrangement of spur gear assembly as used with fully-sprung traction motors

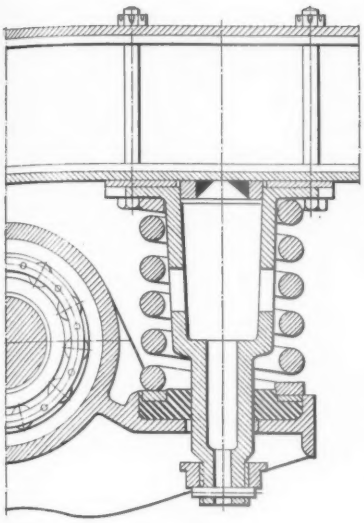
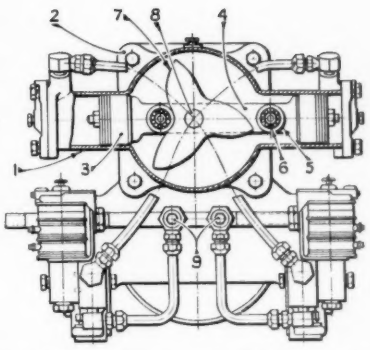


Fig. 9—Primary suspension assembly for trailing bogies. The horizontal location of the axlebox is by the helical springs as well as by the vertical guides and rubber pads

gear developed by Prof. L. N. Reshetov now used as standard with all multiple-unit stock (Fig. 10). The housing of this gear (2) incorporates two pneumatic cylinders (1) which house the pistons (3) operating the star-shaped gear (4) via the rollers (5), running on needle roller bearings, the gear (4) operating the controller camshaft via the shaft (8) and a reduction gear. The pistons (3) are 58 mm. in diameter, while the stroke is limited to 56 mm. Air to the pistons is admitted by the electro-pneumatic valves (9) the complete stroke of the piston in one direction moving the camshaft operating star through 60 degrees. With a 3 : 1 gear reduction each piston stroke moves the controller camshaft through 20 deg. corresponding to one power notch. The complete assembly controller weighs about 200 lb.

Driver's Controls

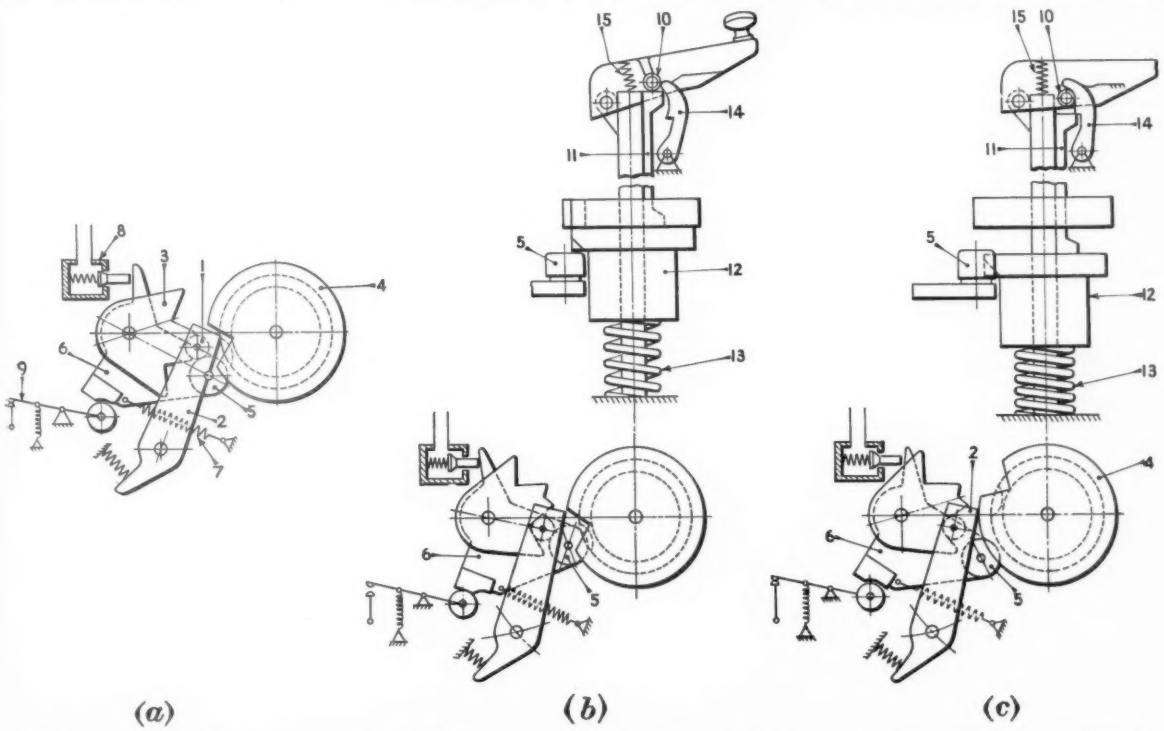
The driver's control handle has eight positions: off, shunting, four running positions, and two positions for hand starting. The initial operating pressure on the handle is 13-22 lb., but only 2·2-5 lb. are needed to hold it down in the horizontal position. The interlocking between the main and reversing shafts and the deadman's mechanism are shown in Fig. 11. With both handles in the off position the roller (1) of the lever (2) rests in the central groove of the reverser segment (3), while the outer end of lever (2) is in a groove of the disc (4) on the main shaft locking it in the off position. The roller (6) carried by the lever (5) is pulled by the spring (7) against the roller (1) thus locking lever (6) in a position at which it cannot affect the pneumatic valve (8) or the dead man's contact (9) which remains closed, while valve (8) is also closed, thus disconnecting the main brake line from the atmosphere. By turning the reversing handle from off to a working position



1 Operating cylinder
2 Housing
3 Piston
4 Operating rod
5 Roller
6 Needle roller bearing
7 Camshaft operating star
8 Shaft
9 Air valve

Fig. 10—The Reshetov camshaft operating gear

the roller (1) will move it a deeper groove in the segment (3), while the lever (2) moving out of the way of the disc (4) frees the main shaft. Simultaneously roller (5) due to the action of spring (7) follows roller (1) and turns lever (6) so that one end of the latter presses down on the deadman's valve (8), while the other end breaks contact (9). To close valve (8) and contact (9) it will be necessary to press down the controller handle which depresses the cam (12) via the pin (10) and rod (11) against the force of the main spring (13). The cam (12) moves the roller (5) sideways turning the lever (6) so as to close valve (8) and contact (9).



(a) Both handles in the off position

(b) Both handles in working position but deadman's handle released

(c) As (b) but deadman's handle depressed

Fig. 11—Driver's controller interlock and deadman's mechanism

In this position pin (11) is locked by lever (14), while spring (13) ceases to oppose the deadman's handle which now has to deal only with the pressure due to spring (15), and the reversing shaft is locked by lever (2) and disc (4). Releasing the deadman's handle releases spring (15) and lever (14), which releases rod (11), while cam (12) forced by the spring (13) releases lever (5) which permits lever (6) to open valve (8) and contact (9), thus applying the brakes and cutting off the current supply via the main switch, respectively.

Brakes

Compressed air is supplied by single-stage two-cylinder horizontal compressors running at 200 r.p.m. and mounted on the trailer cars only, the cylinder bore and stroke being 140 and 180 mm. respectively, while the automatic control switches are mounted in the driving trailers only. The volume of air supplied against a pressure of 115 lb. per sq. in. is about 25 cu. ft. per min. The drive is by a 5·5 kW. motor running at 950 r.p.m. fed from a converter. The clasp brakes on all wheels are operated by two 14 in. cylinders mounted on the body underframe and working on a common rigging system. The maximum brake ratio at tare is 170 per cent, but this gradually reduces to 70 per cent as the speed decreases. The control is by an inertia regulator. As soon as the speed begins to fall, the weight of the regulator begins to move horizontally to the left or right depending on the direction of motion, this operating one of the two vertical levers which lift a valve, thus closing the passage from a differential valve to the air supply of one brake cylinder. Further movement of the weight reduces the pressure in this brake cylinder. The action of the air pressure in the second cylinder actuates the differential valve, which in turn reduces the pressure in this cylinder also, should this be required by the action of the inertia control. At speeds below 10-12 m.p.h. the second brake cylinder is connected to atmosphere and braking is by the first cylinder only. To enable the driver to check brake operation, both brake cylinders of the leading vehicle are connected to a double needle manometer at the driver's stand.

Tests have shown that the following average braking distances can be maintained:

Speed, m.p.h.	Braking distance, ft.
28	330
41	660
53	1,300
62·5	1,900
81·5	3,150

Each vehicle is fitted with two ventilating and heating plants mounted under the roofs of the entrance platforms. Air is aspirated through louvres over the doors and then drawn through oil-wetted wire mesh filters by a blower capable of maintaining an air flow of 1,000 cu. ft. per min. against a total head of 2·35 in. water gauge. The drive is by a 0·5 kW. 50 V. motor. Before entering the aluminium distribution ducts provided under the roof and at floor level along the walls of the passenger space the air is forced through a thermostatically controlled 8·25 kW. heater, one of which is mounted adjacent to each blower. In summer the heater is switched off and by-passed with the aid of shutters. In winter the hot air enters the passenger compartment via the lower duct and through the heaters back into the passenger compartment. In summer cool air enters the passenger compartment through the upper duct. The air flow maintained by both blowers ensures an air change every 3 min. The cab has heaters with a total capacity of 4 kW.

Lighting is by 50-W. lamps in the passenger compartment and 25-W. lamps are used at the entrance platforms, the general lighting intensity being 70 to 75 lu. some 2 ft. 7½ in. above floor level.

REFERENCES

(1) Barski, M. R., Kolisnichenko, V. O., and Kaster, E. S.: "Electrotrain ER.1", (in Russian), Transsheldorisdat, Moscow, 1958.
(2) "Fully Sprung Motors", *The Railway Gazette*, August 2, 1958.
(3) Koffman, J. L.: "Railcar Bolster Suspension", *Diesel Railway Traction*, June 1950.
(4) Koffman, J. L.: "Vibrational Aspects of Bogie Design", *Journal of the Inst. of Loco. Engineers*, Vol. 47 (Part 6,) 1957.

Stainless-Steel Electric Trains in New South Wales

New South Wales Government Railways stainless-steel multiple-unit inter-urban electric train, "The Chips," leaving Sydney Central Station. The line is electrified at 1,500 V. d.c.

RAILWAY NEWS SECTION

PERSONAL

Mr. Herbert S. Morrison, former Deputy Leader of the Labour Party, who retired from the House of Commons last week, has been awarded a life peerage in the Dissolution Honours. Mr. Morrison was Minister of Transport from 1929 to 1931.

Mr. F. Donachy, O.B.E., Member, Scottish Area Board, British Transport Commission, who, as recorded in our September 4 issue, has been made a Part-time member of the British Transport Commission, is 60. He served as a signalman for over 20 years, before becoming a full-time Officer of the National Union of Railwaymen, at the age of 41. He was elected a Member of the N.U.R. Executive Committee and has also been a member of the General Council of the Scottish T.U.C. since 1949, occupying the position of President of the latter body in 1956-57. Mr. Donachy has served on several Government committees. He was a member of the Transport Users' Consultative Committee for Scotland, 1954-58. He has been a Member of the Scottish Area Board of the British Transport Commission since January 1, 1958.

Mr. F. Donachy

Appointed Part-time Member of the British Transport Commission

The late Mr. N. Stocks

General Manager, Paraguay Central Railway, 1944-46

During the absence on leave until the end of October of Mr. J. R. Farquharson, General Manager, East African Railways & Harbours, the Deputy General Manager, Mr. W. Urquhart, will be Acting Commissioner for Transport & Acting General Manager.

Mr. R. Gopalakrishnan, Chief Personnel Officer, Southern Railway of India, has been appointed Chief Commercial Superintendent North-Eastern Railway.

Mr. S. Wright, Assistant (Wages Staff) to the Regional Establishment & Staff Officer, Liverpool Street, Eastern Region, British Railways, has retired. He is succeeded by Mr. W. T. Buxton, Staff Assistant to the Line Traffic Manager (Great Eastern). Mr. A. C. Newell, Second Assistant (Wages Staff) in the office of the Regional Establishment & Staff Officer, succeeds Mr. Buxton.

Mr. A. J. Hay, Stationmaster, Cowlairs, Scottish Region, British Railways, has been appointed stationmaster, Glasgow, Buchanan Street.

Reference is made elsewhere in this issue to the visit to Britain, September 27-October 3, of members of the Danish Institution of Railway Signal Engineers. The members will be lead by Mr. W. Wessel Hansen, Chief Signal Engineer, Danish State Railways. The party will include Mr. N. Forchammer, Chief Civil Engineer; Mr. H. Insulander, Manager; Mr. K. A. M. Jensen, Sectional Civil Engineer; Mr. F. Lowell, Chief Engineer; Mr. E. Simonsen, Divisional Civil Engineer; Mr. P. Valentin, Sectional Civil Engineer; and Mr. A. Wiuff, Civil Engineer.

Mr. E. L. Holmes has been appointed Passenger Traffic Manager, Chicago, Illinois Central Railroad. Mr. David J. Hearne, Assistant Passenger Traffic Manager, will retire because of ill-health. Mr. B. J. Grenrood becomes General Passenger Agent, New Orleans. Mr. R. P. Smart and Mr. E. W. Smith will become General Passenger Agents, Chicago.

Mr. Norman Stocks, General Manager, Paraguay Central Railway, 1944-46, whose death was briefly recorded last week, was born in 1900, and was educated at Christ Church Higher Grade School, Southport. After a brief period with the Lancashire & Yorkshire Railway in its Southport Goods Office, Mr. Stocks entered the Merchant Service as Assistant Purser. During the 1914-18 war he served in the South Wales Borderers, and on demobilisation, in 1920, he continued accountancy and other studies in Liverpool. In April, 1921, he joined the Paraguay Central Railway as Assistant Secretary to the General Manager, in Asunción, and shortly afterwards was promoted to be General Secretary. After serving as Acting Traffic Manager, Acting Chief Accountant and Acting General Manager, successively, Mr. Stocks, in 1940, was made Chief Accountant, continuing to assist the General Manager; and in 1944 he was appointed General Manager. In 1946 he resigned his position for reasons of ill-health, but became a local director of the company.

Mr. J. E. Robson has been appointed to the board of Samuel Osborn & Co. Ltd.

Mr. Orlando Oldham has been appointed Assistant Managing Director of Oldham & Son Ltd.

Mr. W. C. Handley, Mr. D. T. Hollingsworth and Mr. F. Waine, Directors of British Insulated Callender's Cables Limited have joined the board of Scottish Cables Limited.

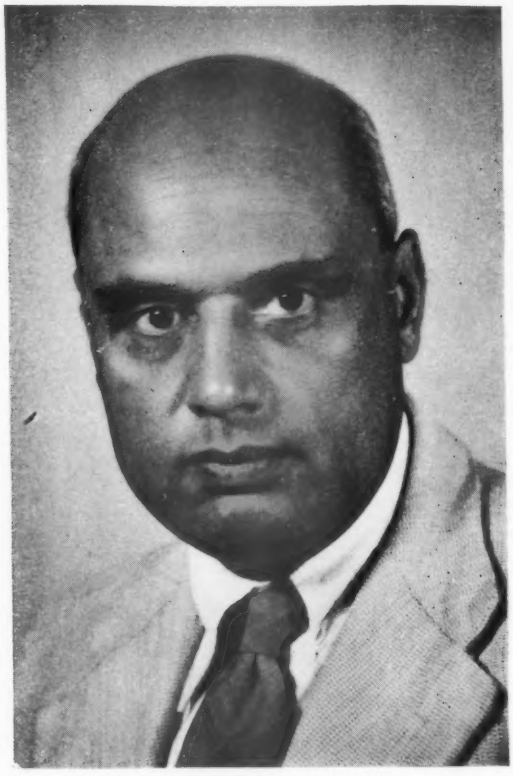
Mr. P. C. Mukerjee, M.A.(Cantab.), M.I.E.(Ind.), Chairman of the Railway Board of India, who, as recorded in our August 28 issue, is retiring, was born in 1904, and educated at Calcutta and Clare College, Cambridge. He began his career, at the age of 21, as Assistant Engineer with the former East Indian Railway, in 1925, and subsequently became Assistant Superintendent (Staff), Employment Officer, Executive Engineer, and Personnel Officer (Senior Scale). During the 1939-45 war his services were requisitioned for the Department of Munitions Production, where he successively held the positions of Deputy Director, Director (Civil Engineering), and Deputy Director-General (Engineering). In 1946 he became Controller of Railway Supplies, Railway Board. He was also Deputy Director-General (Development), Indian Government Industries & Supplies Department. Mr. Mukerjee returned to the East Indian Railway, in 1947, as Deputy General Manager (Works), and, after a brief period of service as Divisional Superintendent, was appointed General Manager of the Bengal Nagpur Railway in April, 1948. In 1949 he became the first General Manager of the Indian Railways' Locomotive Works at Chittaranjan, a project with which he was connected from its inception. During his last year at Chittaranjan he also worked as a member of the Defence Ministry's Ordnance Factories Reorganisation Committee. Mr. Mukerjee was appointed General Manager of the Eastern Railway early in 1954, and, later the same year, became a Member of the Indian Railway Board and became Chairman of the Board in 1957.

Mr. H. Carr has resigned from the board of Drummond Brothers Limited on reaching retiring age. The company is a subsidiary of Asquith Machine Tool Corporation Limited.

Mr. R. W. Storey has been appointed Managing Director, Pelapone Engines Limited. He succeeds Mr. W. Speight who is retiring from the board after 12 years as Managing Director.

Mr. K. B. Mathur, M.Sc., Member, Transportation, Railway Board of India, who as recorded in our August 28 issue, has been appointed Chairman of the Board, was born in 1904, and was educated at Kanpur and Muir Central College, Allahabad. He graduated as M.Sc. and worked as a Professor of Physics, at Ewing Christian College, Allahabad. He joined the East Indian Railway, in 1928, as Probationary Assistant Transportation Superintendent. He later served as a senior scale officer, in various capacities in the Commercial and Transportation Departments. In 1922 he was loaned to the Defence Department, and took charge of all rail movements in the Eastern Army zone. On release from the Defence Department he returned to the East Indian Railway, as Superintendent Transportation, Howrah. After a period as Superintendent Transportation, Asansol, he was promoted to be Divisional Superintendent (Transportation), Dhanbad. In 1947 he became Deputy Chief Commercial Manager (Goods), at headquarters, and, later that year took over as Divisional Superintendent, Allahabad. In January, 1948, he became Chief Operating Superintendent, E.I.R. In March, 1951, he officiated as General Manager in the absence of Mr. B. B. Varma. Mr. Mathur resumed duties as Chief Operating Superintendent in November, 1951. He was appointed General Manager of the Bengal Nagpur Railway in January, 1952, and of the Eastern Railway of India later the same year. He became a Member of the Indian Railway Board in 1954. He was a delegate to the International Railway Congress, Lucerne, in 1947. In 1956 he visited Washington in connection with a loan for India, with particular reference to the Indian Railway Modernisation Plan.

Mr. P.C. Mukerjee
Chairman, Indian Railway Board 1957-59



Mr. K. B. Mathur
Appointed Chairman, Indian Railway Board

Mr. Allan Yeaman, District Traffic Superintendent, Inverness, Scottish Region, British Railways, has been appointed Traffic Manager, Northern Divisio This is a further step in the reorgar on of Scottish Region. The Northerr vision will cover the Highlands and mainly will consist of the existing Inverness and Perth Districts. Mr. Yeaman will combine the duties of Traffic Manager with his existing position of District Traffic Superintendent and will be located at Inverness.

Mr. H. Riggall, Managing Director & Deputy-Chairman, Ruston & Hornsby Limited, is, at his own request, relinquishing his executive responsibilities from December 31, on reaching retiring age. He will remain with the company as a Non-Executive Director and as Deputy-Chairman. He will also retain the Chairmanship of Ruston & Hornsby (Australia) Pty. Limited. He will be succeeded as Managing Director by Mr. V. R. Prehn and Mr. G. W. Bone, who will become Joint Managing Directors on January 1.

Mr. J. W. Christopher

District Operating Superintendent, Kings Cross, Eastern Region, 1957-59

Mr. K. D. Rhodes

Appointed District Engineer, Cardiff, Western Region

The late Mr. P. Goddard

Traffic Manager, Central Argentine Railway, 1943-47

Mr. J. W. Christopher, District Operating Superintendent, Kings Cross, Eastern Region, British Railways, who, as recently recorded, has retired, joined the former Great Northern Railway in 1909, as a trainee clerk at Grantham Goods, and served during the next few years at several other stations. From 1914 to 1918 he was on active service, and was mentioned in despatches and awarded the French Medaille Militaire and Croix de Guerre avec Palme. In 1920 he was appointed Stationmaster, Stainby. He later became, successively, Controller at Nottingham, District Inspector at Ipswich and at Newcastle, Deputy Chief Controller Eastern Section L.N.E.R. (Southern Area) and Chief Signal Inspector in the Western Section. In 1942 Mr. Christopher became an assistant to the District Operating Superintendent, Nottingham. After spending a short time as Assistant District Superintendent, Lincoln, he returned to Nottingham as Assistant District Superintendent in July, 1945. He was appointed Assistant District Operating Superintendent, Kings Cross, in September, 1948, and District Operating Superintendent there in July, 1957.

Mr. K. D. Rhodes, B.Sc.(Eng.), A.M.I.C.E., Organisation & Methods Assistant, Paddington, Western Region, British Railways, who, as recorded in our June 19 issue, has been appointed District Engineer, Cardiff, was trained at the School of Economics, Regent Street Polytechnic, London, and joined the Great Western Railway in the Chief Engineer's Office, Paddington, in 1936. Mr. Rhodes served in the New Works Drawing Office, before joining the Resident Engineer's staff. He was engaged on the electrification of the Central London Railway, from North Acton to Greenford. He was mobilised, as a Territorial, in August, 1939, and was commissioned in the Royal Engineers. In 1940, he was posted to the Middle East, and served in the Sudan and Eritrea. In 1941, Mr. Rhodes was seconded to the Sudan Railways, as Assistant Engineer, and subsequently became Resident Engineer. Recalled to military duty in 1943, he served in Sicily and Italy as Adjutant, 1212 Railway Construction & Maintenance Group, R.E. In 1945, he was appointed Staff Captain, Railway Construction, War Office. He was Mentioned in Dispatches for distinguished services in Italy. He returned to the G.W.R. in January, 1946, and served in the District Engineer's Office, Neath. In October that year he was appointed Assistant to the Divisional Docks Engineer, Barry Docks. In 1947, he became Resident Assistant Engineer, Newport Docks, and was appointed Assistant in the District Engineer's Office, Newport, in 1949. Mr. Rhodes became Assistant District Engineer, Cardiff, Valleys District, in 1951, and later became Assistant District Engineer, Newport. He was made Organisation & Methods Assistant, Paddington in January, 1956.

Mr. J. M. S. Coates has joined the board of George Angus & Co. Ltd. He was a partner, until his retirement in June, of Price Waterhouse & Co. Ltd.

Mr. D. K. Heiple has been appointed Manager of the newly-formed Sales Development Department, LeTourneau-Westinghouse Company.

Transport Users' Consultative Committee, South Western Area

The third term of office of the Transport Users' Consultative Committee for the South Western Area has expired. The Minister of Transport & Civil Aviation has appointed a new committee, which will serve until July 31, 1962. Maj.-General W. E. V. Abraham will be Chairman, Mr. P. H. Simms will be Secretary, and the following will be members:

Representing Agriculture
Mr. G. R. Sargeant*.

Representing Industry
Mr. C. J. Horsley, Mr. G. H. Bedford, Mr. J. N. Smith*.

Representing Commerce
Mr. W. J. Salter*, Mr. W. G. Dascombe*.

Representing Shipping
Mr. A. L. Duggan.

Representing Labour
Mr. H. Forrest, Mr. A. S. Dopson.

Representing Local Authorities
Mr. E. G. Lilley, Mr. F. G. Wilkins, Mr. G. F. Drake.

Representing the B.T.C.
Mr. I. R. Patey, Mr. L. Edwards*.

Additional Members
Mrs. P. Davidson, Mrs. I. Seed.

Three members, two to represent agriculture and one to represent local authorities, have yet to be appointed.

* Indicates new member.

Mr. Percy Goddard, Traffic Manager, Central Argentine Railway, 1943-47, whose death, in Buenos Aires, was briefly recorded last week, was 74. Mr. Goddard began his railway career, in 1899, on the former Midland Railway, at Ecclesfield. Two years later he went to South Africa to join the Cape Government Railways. He resigned, in 1904, to join Guthrie & Co. Ltd., and served first in the head office, Port Elizabeth, and later as Branch Manager, Colesberg. Mr. Goddard joined the Central Argentine Railway in 1907. He served on various parts of the system and, in 1922 was appointed Divisional Traffic Superintendent Retiro Terminus, Buenos Aires. He became Chief Traffic Controller in 1924, Assistant Traffic Manager in 1926, and Traffic Manager in 1943. He retired in 1947.

Institution of Locomotive Engineers Awards

The Institution of Locomotive Engineers have announced the following awards:—

The Frederick Harvey Trevithick Award
Mr. S. O. Ell for his paper "The mechanics of the train in the service of railway operation."

The Institution of Locomotive Engineers Award
Mr. R. M. Hancock for his paper "Vehicle suspension and bogie design in relation to track conditions."

The Alfred Rosling Bennett Award
Mr. T. Schur for his paper "Some design considerations of main-line diesel locomotives."

The Charles S. Lake Award
Mr. B. W. Anwell for his paper "Developments in the detail design of diesel locomotives."

The William Alexander Agnew Award
Messrs. G. R. Mahy and H. W. Mear for their joint paper "The two Derby diesel-electric locomotives—design and construction."

The Stewart Dyer Award
Mr. R. K. Sethi for his paper "Introduction of diesel locomotives on Indian Railways."

The Graduates' Award
Mr. F. Rich for his paper "Some details of steam locomotive design affecting the footplate man."

A President's Prize
Mr. A. S. Lawrie for his essay on the Institution's visit to Derby Locomotive Works on March 19, 1959.

NEW EQUIPMENT AND PROCESSES

Hydraulic Tamping Machine

A CONSIDERABLE increase in the speed of track-laying and track maintenance is claimed by the makers of an all-hydraulic tamping machine now available in Great Britain. Suitable for the tamping of wood, steel, or concrete sleepers, the machine has a running speed of 31 m.p.h., and an operating speed of 1,800 ft. per hr. The non-synchronised hydraulic closing-in, under a pre-set pressure, of the tamping tools allows independent operation of each tool. This ensures that the ballast packing continues until all 16 tamping tools have closed in to the pre-set pressure.

A device is fitted which automatically positions the machine over each sleeper as work proceeds. Overall dimensions of the VKR03 machine, which weighs 15 tons and is powered by a 95-b.h.p. engine, are: length, 21 ft. 4 in., width 8 ft. 8 in., and height from rail, 8 ft. 10 in.

The main frame is a welded assembly of longitudinal girders and crossmembers. At the rear end the frame extends over the axle to form a mounting for the engine and radiator unit. The top deck is an ¼-in. chequer plate welded to the longitudinals, the frame side members being carried well down below the wheel centres. The axle-boxes, carried in circular housings bolted to the side members, are mounted on rubber blocks. This form of rubber suspension is stated to give good track holding and effectively to isolate the machine vibrations from the track.

Hydraulic Braking

The leading wheels are 1 ft. 6 in. dia. and the rear wheels 2 ft. dia. Hydraulic brakes operating on the front and rear wheels are foot-pedal-operated. The cable-operated handbrake operates on the rear wheels only.

Bolted to the frame at the front end is a welded steel structure carrying the tamping units. The arrangement of these ahead of the front axle ensures that the machine weight is carried on the packed ballast. The tamping tine-heads are raised from the working position by a vertical hydraulic cylinder working over a fixed piston. To cushion vibration the piston rod ends are anchored in rubber bushings. Two cylinders, each carrying a pair of tines working inside and a pair working outside the rail, are mounted on each side of the frame. The tines may be adjusted while working to operate at either normal or double depth, the maximum depth being 17¾ in. from the top of running rail.

The tool-holder is a pivoted beam, rocking of which is actuated by a revolving eccentric. Mutual closing in of each pair of tool holders to effect packing of ballast is by hydraulic pressure applied at the lever pivots. To avoid sleeper movement and to ensure even packing, each pair is operated independently. An important feature of this independent operation is that if one tamper is checked by an obstruction the remaining tampers continue closing in until selected packing pressure is reached.

The hydraulic closure is under lever control and a pressure limiting valve eliminates the risk of tool breakages due to overload. A simple control is incorporated to allow the normal working pressure to be increased when tamping broad- or double-width sleepers. The rocking beam eccentrics are driven by multi-vee belt drive from a cross-shaft which is engine-driven through a pair of spiral bevel gears.

Oil pressure for lifting each tamping head is supplied by a vee-belt-driven Plessey pump operating at 140 lb. per sq. in. To suit any grade of ballast material the hydraulic pressure on the tampers can be varied between 140 and 850 lb. per sq. in., normal operating pressure being about 500 lb. per sq. in. Pressure is supplied by a valveless screw pump operating through a master cylinder carrying the control valves.

To eliminate any movement during tamping of the rail after removal of the lifting jacks, vibration damping clamps are fitted to the front of the tamping head. Fitted with automatic hydraulic operation these firmly grip the rail as the tines enter the ballast. Release is also automatic as the machine moves forward.

Crib Tamping

To consolidate the ballast between sleepers a crib tamper is attached to each side of the machine. This is an electrically-operated vibrator carried on a radius arm which is raised and lowered in synchronism with the tines by a hydraulic jack. It has been found that the crib tamper, operating at 2,800 vibrations per min. and a compacting pressure of 75 lb. per sq. in., increases the durability of the condensed ballast by about 25 per cent.

The power unit is a Meadows six-cylinder direct-injection diesel 6DT500 rated at 95 b.h.p. at 1,700 r.p.m. This is an 8-litre engine having an equal bore and stroke of 120 mm. The equipment includes a crank-shaft vibration damper, automatic advance of fuel injection, wet liners, pre-finished copper-lead bearings, and stellite-faced valves. The engine-driven generator is of sufficient capacity to supply floodlights for night working. Two fuel tanks with a combined capacity of 54 gal. are underslung at the rear end. The operator's controls for travelling to

the site are: accelerator, footbrake, handbrake, clutch pedal, and gear-change lever. The driver's seat faces the side of the machine to provide good visibility in either direction of travel. The gearbox provides five travel speeds in either direction, a separate lever being fitted for selection of forward or reverse. For control when tamping, the operator is seated at the front end, with a clear view of the tamping tines. Lifting and lowering of each head independently is controlled by a foot pedal, and hydraulic closing of the lines by a hand lever. Immediately the tines are withdrawn from the ballast the machine automatically moves forward and stops with the tines correctly positioned over the next crib. This automatic travel control and indexing largely contributes to the high-speed fool-proof operation of the machine.

A steel canopy carried on tubular supports is fitted over the full length of the machine. Canvas side curtains provide full weather protection for the equipment and, as an optional fitting, a fully enclosed cab can be provided for the operator. A seat is provided for the guard and a working crew of 14 is transported on the machine to the site. Tools and loose equipment are carried in steel containers at each side.

Operating Performance

The maximum tamping rate of the VKR03 machine is 1,800 ft. per hr. In practice, this works out at 2,400 yd. of tamping for the normal 8-hr. Sunday possession of the track. If a three to four-hour possession on four nights a week can be included, the weekly total is about 7,000 yd. of track.

It is possible to exceed these figures considerably by use of equipment to remove the tamping machine from the track without leaving the site. Fitted to the machine are four transverse rollers and four lifting jacks. The power jacks lift the machine and a pair of "set-off" rails are placed under the rollers. With a hand winch the tamper is then rolled clear of the track on to a pair of transverse rails. The complete operation takes 90 sec. and, on some continental railways, the tampers are covering 700 yd. a day on tracks with 15-min. train intervals. Further details of this machine, which is of Austrian design, are obtainable from Plasser Railway Machinery, 46, Charlotte Street, London, W.1.

Collapsible Pallet

A NEW collapsible pallet ensures complete safety and rigidity during transport and storage. The load is carried through the main uprights and not on hinge pins, and gives a stacking capacity of five high, with a 7½-ton static load.

The two opposite sides can be safely removed without loss of rigidity, and can be made as illustrated, completely detachable or hinged, making the pallet a single unit.

When collapsed, the pallet is reduced to ⅓ the erected height, the design giving the same safety stacking as when loaded, providing the ideal answer for economy of storage space for return shipment.

This new idea in construction (patent applied for) costs little more than the fixed-box type of pallet.

Further details can be obtained from Metal Products (Arden) Limited, 65-70, Gt. King Street, Birmingham 19.

Binding System

THE Self-Bind system provides a space-saving method of preserving office records and booklets and eliminates the use of transfer storage files. Junior staff can convert loose papers into a neatly-bound book which opens flat, with a "stay-put" opening, to show every page and all marginal notes. Filing can thus be reduced in thickness. Papers cannot be mislaid, yet single sheets can be removed and later rebound.

The standard kit comprises supplies of all necessary materials and a spare clamp mechanism. Price is £27 6s. Other models are available.

Further details can be obtained from Westwood Paper Limited, 185, Goswell Road, London, E.C.1.

Veneer Laminates

BELFORT plastic laminates are finished with real wood veneer and do not require polishing. The new laminates are impregnated with a Cellobond melamine resin and combine the natural decorative beauty of wood with the durability inherent in plastics sheet.

Conventional methods of finishing are completely eliminated. Surface abrasion resistance compares favourably with that of the printed paper laminates though hardness is slightly less because of the fibre and cell construction of wood.

Exceptional stain resistance is claimed and complete resistance to alcohol, fruit juices, and household chemicals. It is not easily marked by burning cigarettes and can be cleaned with a damp cloth.

The laminate is supplied in sheets 8 ft. by 4 ft. and approximately 1/16 in. thick. Slight variations in thickness must be expected because of differences in the compressibility of the various woods employed. The following woods can be supplied: Sapele, figured mahogany, figured limba, afrormosia, and makore. This range will be increased.

The laminates can be cut with any high speed fine-tooth circular saw and will bond perfectly with a normal urea/formaldehyde adhesive, either cold-setting or in a heated press (up to 160 deg. F.). It is

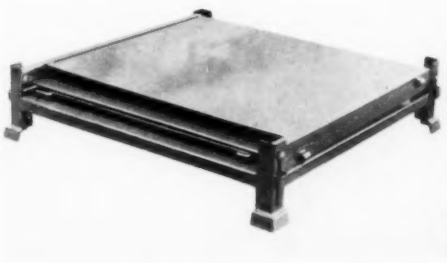
especially recommended as panelling for road and rail coach interior where primary requirements are finish and durability.

Further details can be obtained from Bonded Laminates Limited, CHN Veneer Mills, Chisenhale Road, London, E.3.

Roller Steel Shelving

ROLLER steel shelving forms racking of new design. It comprises 9 ft. 4 in. high x 2 ft. wide x 4 ft. deep units and Weldmesh partitions.

Each unit includes two 2 ft. square shelves mounted on rollers so that products can be loaded on one side and unloaded from the



other. As a shelf becomes empty, it is returned for re-loading, while the loaded shelf is quickly and easily pushed across to the unloading side.

Further details can be obtained from Metalrax Limited, Bordesley Green Road, Birmingham.

Draw Bender for Light-Gauge Tubes

A MANDREL-TYPE hand-operated small-radius precision bender has been developed which can bend steel tubes from ⅜ in. to 1 in. outside diameter to throat radii equal to twice and in certain cases, one and a half times the tube diameter.

To operate, the tube is fitted on the mandrel, a pre-set stop on which locates the bending position. Quick-acting clamps secure the tube and position the back former correctly. Angle of bend is fixed by an adjustable ring-stop.

All formers and back formers, which are interchangeable, are machined to suit tube dimensions. Special forming dies can be supplied for non-standard materials.

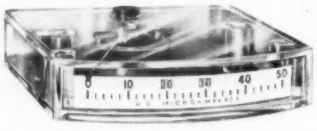
The machine can be supplied for bench mounting or with a stand to enable intricate shapes to be produced without alteration to " handing " and without fouling the pedestal.

Further details can be obtained from the manufacturer, Chamberlain Industries Limited, 3, Buckingham Palace Gardens, London, S.W.1.

Miniature Edgewise Meter

A MINIATURE edgewise meter—the Model 220—has been developed for use in complex and crowded control panels where front space is at a premium. Of importance in multi-channel installations is the ease of mounting several of these meters close to one another to facilitate comparative readings. When so mounted, readings are not affected by the proximity of ferrous metal or magnetic fields as the basic movement is of centre-pole design; this provides inherent magnetic shielding.

The new meter can be supplied as a voltmeter, milliammeter, and microammeter, commencing from very high microamps. These ranges also can be supplied with recti- for operation on a.c. supplies. The er is available with right-hand zero, left-hand, displaced, or centre-zero pointer position, and is suitable for horizontal or



vertical mounting. The transparent case allows maximum light to fall on the scale and results in shadowless reading. Space frontage is only 2.5 in. x 0.62 in.

Further details can be obtained from Taylor Electrical Instruments Limited, Slough.

Attachments for Saw

THREE attachments have been introduced for the Robinson ET/E dimension saw: there is a drop-down cutting-off gauge, a retractable gauging fence, and a hold-down roller.

The cutting-off gauge remains on the machine during change-over of saws. It is always readily available, quickly brought in use, and self-squaring. It is used with the front extension rolling table and is provided with an adjustable length-gauging turn-over stop.

When ripping, the rolling table is locked in position and the cutting-off gauge is raised, drawn back slightly, and then lowered. In this position both gauge and stop are below the level of the table top and neither interferes with widthing. For cross-cutting, the procedure is reversed and the fence aligns itself correctly in vee slots.

The gauge is attached to and can be removed complete with the front extension table. It can be supplied to gauge up to a maximum of 4 or 8 ft., and will cross-cut up to 3 ft. 7⅜ in. x 1 in. thick when used with a standard rolling table and 4 ft-4½ in. x 1 in. thick when used with an extended rolling table. It can be used for square cross-cutting only.

The retractable gauging fence provides a convenient and accurate means of dimensioning " dead " materials such as inter-laminate plastic, compressed asbestos cement and printed circuit, which are normally cut using the rolling table. The retractable fence fits to the main fence and has two indexing faces accurately aligned and parallel to the main fence against which the edge of the sheet is butted to position it on the rolling table before cutting. The indexing faces are then retracted to allow the sheet to be fed through easily and without friction. The main weight of the sheet is thus borne by the table and a very sensitive control can be exercised during the cut.

The retractable fence is held to the main fence by two thumbwheels and is readily detached. It moves with the main fence, which is provided with quick and fine adjustment, and each indexing face has independent adjustment for lining-up. A palm-grip handle for setting in normal or retracted position is easily reached by the operator from his working position. The fence can be used with a standard table, giving a distance of 2 ft. 3½ in. from saw or cutting disc to indexing faces, or with a rear extension table to increase this to 3 ft. 11½ in.

The hold-down roller is intended for use when working flexible sheet material with a tendency to buckle and chatter. By using the roller the operator can control the sheet more easily and safely. The attachment fits to the main fence and can be easily adjusted for height and pressure. A sealed-for-life ball bearing roller is fitted.

Further details can be obtained from the manufacturer, Thos. Robinson & Son Limited, Rochdale.

East Coast Main Line Widening

Construction of an additional line between Pilmoor and Alne Stations, North Eastern Region

One of the most important improvement schemes so far undertaken by the North Eastern Region of British Railways is the widening of the East Coast Main line north of York, by the construction of an additional line between Pilmoor and Alne Stations. Construction of this new section of line will mean that throughout the 30 miles between Northallerton and York Skelton there will be two lines in each direction.

This will eliminate the bottleneck which has previously existed between Pilmoor and Alne where the one southbound line has been required to carry an average of 130 trains a day ranging from high-speed East Coast expresses to heavy freight mineral trains.

The new five-mile section of line will join the secondary south-bound line which previously terminated at Pilmoor with the secondary southbound line which commenced at Alne. The new line is to be track circuited throughout and equipped with colour-light signals. A new junction is to be installed at Pilmoor to permit trains to be diverted from one line to the other at speeds of up to 50 m.p.h.

In addition to easing the problem of traffic working, it will be possible to schedule more advantageous freight train timings. In this connection the majority of the trains from Tees-side and the North which have hitherto had to be routed via the Leeds Northern line (Ripon, Harrogate, and Wetherby), are being diverted to travel over the main line via York. This avoids the necessity to provide banking engines on the Leeds Northern route and will result in speedier transit times and the more efficient and economical use of engines and train crews.

To accommodate the new up line it has been necessary to carry out considerable widening of track formation and bridges. In all, five road bridges and three rail bridges have had to be reconstructed, major work being done during weekends to keep interference with main line trains to a minimum.

Long Welded Rails

Long welded rails are being installed on the new track and, for comparative purposes, three different rail-welding practices are being adopted. One section of the line will consist of 60 ft. lengths of rail welded together on site to form fully continuous rails ; another will be of 300 ft. lengths, flash butt welded in Dinsdale Rail Welding Depot and fishplated together on site, and similar 300 ft. lengths of welded rail will be used on a further section, but will be welded together on the site to continuous lengths. It will thus be possible to check the relative performance of these different practices under intensive traffic conditions.

Signalling Improvements

Various signalling improvements associated with this scheme are also being carried out. The two secondary lines between Thirsk and Pilmoor have recently been equipped with automatic colour-light signals and will form part of continuous colour-light signalling and track circuiting on all four lines between York and Northallerton.

The existing lever frame in Pilmoor South Signalbox is to be replaced by a switch console from which signals and points are to be electrically controlled. Light indications on the console will enable the signalman to follow traffic movements without the necessity of actually seeing the trains. Trains leaving Thirsk for York will immediately be indicated on the Pilmoor console, and it will be possible to follow the progress of a train or trains over a distance of more than six miles. A similar indication is given of trains in the opposite direction from Tollerton. In the event of a train being detained at one of the numerous signals in the section, the driver can contact the signalman by telephone and receive instructions as to the procedure to adopt.

The structure of the existing Pilmoor Signalbox is to be extended so that the additional signalling equipment can be accommodated. At Tollerton a new signalbox is to be built and equipped with signalling apparatus similar to the Pilmoor box.

Opportunity is also being taken to renew the whole of the existing signalling equipment between Tollerton and Pilmoor. This entails a complete renewal of the signalling cables and a new method of laying the cables is being adopted. Previously it has been the practice to bury the cables but these are now being laid in 30-ft. lengths of reinforced concrete troughing.

Automatic Warning Control is an integral part of the new signalling equipment and will be brought into use when installation of A.W.C. equipment has been completed on all sections of line between York and Newcastle.

Laying long welded rails for the new up slow line between Pilmoor and Alne

Kings Lynn Storage Depot

The first phase of a private scheme to convert the disused South Lynn Station and marshalling yard at Kings Lynn, on the Eastern Region of British Railways, into a dry goods and refrigerated storage depot was opened by the Mayor of Kings Lynn yesterday (Thursday). This consists of 300,000 cu. ft. of dry goods storage space and 100,000 cu. ft. of refrigerated storage space. The depot has full rail and road facilities and plans are in hand for further expansion.

Negotiations began in June this year between Harry Pointer (Norwich) Limited, Public Works & Civil Engineering Contractors, and British Railways, for the former to lease and develop the site. A feature of the work since then has been the close co-operation between the six organisations concerned, including the Town Planning Authorities, making possible a rapid rate of progress. This was necessary to provide space for a cargo of dry goods due to arrive from Italy for storage on September 14.

Mobile Design Team

Design work was started only 10 weeks ago by the consulting engineers Messrs. Fredrick S. Snow & Partners which sent a complete engineering and drawing office staff to the site within 24 hr. of the start of the project. Accommodation was provided in two restaurant cars loaned by British Railways.

Starting in mid-July, the staff of British Railways removed some 1¼ miles of redundant track and re-adjusted the alignment of that which remained. Ground tests revealed the need for piling and this work was undertaken by Frankipile Limited, of London, which submitted a basic tender at a few hours notice and started sinking some 160 45-ft. concrete piles only five days after the original telephoned enquiry was made. Concurrently the contract for the main steel-framed and sheeted part of the building was let to Coseley Buildings Limited of Wolverhampton which immediately proceeded with detail design and fabrication work and undertook to complete the erection at site in 30 working days, starting on August 11.

Refrigeration plant has been prepared by the Norwich firm of Mann Egerton Limited, which was consulted at the earliest planning stage. In 1960 it is hoped to double the size of the stores and during the next two years to develop the rest of the sidings for handling bulk mineral goods from rail transport to consignee. The service will be offered to any firm wishing to warehouse dry or frozen goods or for bulk rail traffic handling to and from the Continent and elsewhere.

MANCHESTER LONDON ROAD STATION TO BE RE-NAMED PICCADILLY.—London Road Station, Manchester, in the London Midland Region of British Railways, which has borne that name for over a century, is to be renamed Manchester Piccadilly when the £1,700,000 modernisation scheme is completed in 1962. The new name is considered more appropriate as the station approach leads into Piccadilly. Demolition of the stone facade, which was erected in 1869, has begun and is expected to take six weeks. Reconstruction of the station is associated with electrification of the line to Crewe.

Solid Fuel Depot at Walworth Road, Southern Region

Rapid unloading with aid of traverser; provision for handling wagons of 36 tons gross weight

General view at rail level, showing traverser in action

A new solid fuel depot opened on the site of the former Walworth Road Coal Depot, London, S.E., on September 21, has been built at a cost of more than £300,000 by British Railways, Southern Region, under the modernisation programme. It replaces the Walworth Road Coal Depot, constructed 65 years ago. The Midland Railway Company built the former depot to develop the sale in South London of coal from collieries served by its system. The depot was transferred from the London Midland to the Southern Region in 1950.

The site is on the down side of the line from Holborn Viaduct to Loughborough Junction, a little south of Elephant & Castle Station. The old depot was a timber superstructure with iron and timber supports which by 1958 urgently needed renewal. It was decided to replace it completely with an altered layout.

Provision for Handling Smokeless Fuel

The decision took account of a possible decline in coal sales in the area, but it was felt that the demand for solid fuel as a whole in this area would continue for many years. Future legislation might mean that the depot would handle large quantities of smokeless fuel, and this was borne in mind in the design of the new layout.

Other reasons for rebuilding on this site were that the depot supplied more than 50,000 customers, most of whom had to depend on current supplies because they had no accommodation for storing fuel. Walworth Road Depot was regarded in the coal trade as the most important coal depot in London for the supply of domestic fuel.

Coal merchants attached much importance to the chute facilities available at the depot, which quickened unloading of wagons by six or seven times compared with the speed of unloading at a "flat siding" depot. If Walworth Road had to be replaced by one or a series of flat siding depots, six or seven times more siding accommodation would be required, and a considerable increase in the labour strength necessary for bagging, weighing, and so on. The coal trade felt that it could not face this additonal commitment because of the difficulty in recruiting labour for this type of work.

One of the basic requirements was speed in unloading from wagons to road vehicles: Many of the 50,000 dwellings served by the depot in a crowded area of South London have little space for coal storage and demand fluctuates very sharply and urgently with the weather.

The old depot and the new were both based on the difference in height between the railway and the road. The running lines at this point are carried on brick arches 20 ft. above ground level, so that coal can be discharged from bottom door wagons into hoppers through chutes into bags for weighing before loading on to road vehicles. There are also some straightforward coal drops to the coal storage areas.

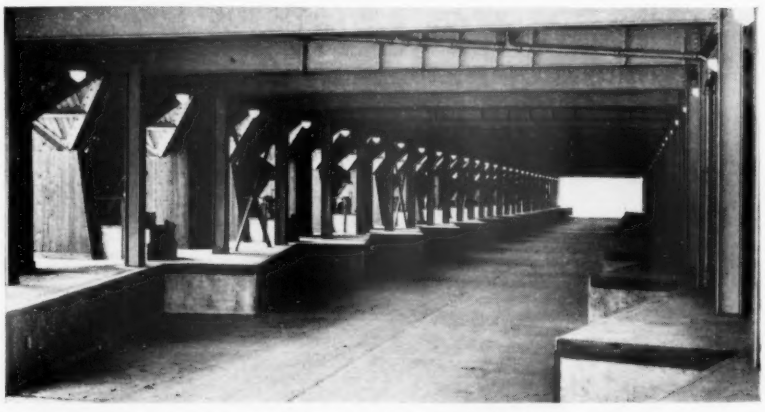
The reconstruction of the depot on a like-for-like basis, with structures reinforced to take 24½-ton wagons instead of timber structures, would have cost some £400,000 at 1956 prices. This course would not be satisfactory as the arrangement in the unloading bays, with three wagons, one over a "slip" (chute) and two over hoppers, delayed clearance and dispersal of wagons. This was because: (*a*) partial unloading occurs when there is insufficient space in hoppers; (*b*) disposal of empties is delayed until the wagon next to the traverser line is available for removal; and (*c*) cripple wagons impede movement.

Traversers

It was considered that a layout with a traverser positioned centrally between two rows of unloading bays would overcome the difficulties. This arrangement enables individual wagons to be handled more expeditiously and cripple wagons to be withdrawn and transferred easily to a cripple siding. Considerations of economy suggested that a new depot with improved layout could function without "slip" facilities and one-third of the present hopper accommodation.

At rail level the new depot consists of: (*a*) two sidings, reception and departure lines, each accommodating 20 16-ton wagons each and connected to the down line at the country end of the depot; (*b*) cripple wagon siding holding four wagons; (*c*) three hand-operated wagon turntables, two installed in the main sidings and the other serving the cripple siding; (*d*) 50 transverse unloading bays arranged in two rows of 20 and 30; (*e*) two electric traversers, each equipped with capstan and capable of transporting one wagon of 36 tons gross weight. Only one traverser will be used at the one time, the other traverser will be held as a spare for breakdowns and so on; (*f*) two capstans with fair leads adjacent to the reception and departure sidings for moving wagons.

At ground level there are two series of loading docks to be served by the 50 hopper chutes with circulating cart roads affording access and egress from the Steedman Street end of the depot; and weighbridge office and 30-ton weighbridge.



Coal hoppers at road level, Walworth Road Solid Fuel Depot

Brunel Centenary Celebrations at Bristol

The President, Professor A. J. Sutton Pippard, and Council of the Institution of Civil Engineers, as recorded last week, travelled to Bristol on September 15 for the unveiling of the memorial plaque on Clifton Suspension Bridge, Bristol, to commemorate the centenary of the death of Brunel, designer of the bridge. The celebrations were under the auspices of the Clifton Suspension Bridge Trust. Guests who travelled with the party from Paddington in the 1.15 p.m. train included Mr. M. G. R. Smith, M.I.C.E., Chief Civil Engineer, and Mr. C. J. Rider, Public Relations & Publicity Officer, British Railways, Western Region

Mr. H. G. Lakeman, District Engineer, Bristol, Western Region, was among those who attended the proceedings in Bristol. The Western Region arranged for "Castle" class locomotive No. 5069, *Isambard Kingdom Brunel*, to haul the train.

Mr. J. R. Hammond, General Manager, Western Region, introduced the train crew to the President of the Institution before departure from No. 1 platform, Paddington. Professor Pippard presented a gold sovereign to the driver and a half-sovereign each to the fireman and guard "to commemorate the occasion and as an appreciation to train crews everywhere on British Railways."

Unveiling of the Memorial Plaque

Mr. Edmund Poole King, Chairman of the Clifton Suspension Bridge Trustees, gave the opening address at the unveiling ceremony. Professor Pippard then delivered his address on the centenary. Some of his remarks were summarised in last week's issue.

The Dowager Lady Noble, grand-daughter of Brunel, performed the unveiling ceremony. Mr. M. G. R. Smith proposed a vote of thanks.

The commemorative plaque has been fixed to the out-cropping limestone on the Clifton approach to the bridge and between the toll-houses and the bridge piers. It is of Westmorland green slate and bears a bronze relief of Brunel. The inscription reads: "Isambard Kingdom Brunel, 9th, April 1806-15th September, 1859. This stone was laid by the Clifton Suspension Bridge Trust, 15 September, 1959."

The association between the Clifton Suspension Bridge and the Royal Albert Bridge, Saltash, Brunel's greatest railway bridge, is referred to editorially on page 194 of this issue.

After the ceremony a visit was paid to the Brunel Exhibition at the Bristol City Art Gallery. This illustrated *inter alia* the work of Brunel in connection with the London to Bristol Railway, the Clifton Suspension Bridge, Bristol Docks, and the building of ss. *Great Eastern*. Exhibits included a model of the G.W.R. broad-gauge 4-2-2 locomotive *Iron Duke*, a section of the "atmospheric railway" (part of the South Devon Railway, later G.W.R., between Exeter and Newton Abbot), some of Brunel's notebooks with sketch drawings, a model of Brunel's railway terminus at Bristol, models of signals used by Brunel, and presentation plate. Also shown were original designs by Brunel for the Clifton Suspension Bridge and Sir Daniel Gooch's engineering notebook.

The combined programme and luncheon menu card, produced for the party from London by the Institution of Civil Engineers in conjunction with the Public Relations & Publicity Department of the Western Region, bore a reproduction of a well-known pen-and-ink drawing of Brunel in a characteristic pose, top-hatted and smoking a cigar.

At Paddington on September 15: (left to right) Driver John Gale, Guard David Wills, Professor A. J. S. Pippard, Mr. J. R. Hammond, and Fireman Gordon Phillips

L.B.S.C.R. "Gladstone" Presented to B.T.C.

The Chairman of the Stephenson Locomotive Society, Mr. T. P. Hally-Brown, accompanied by Mr. A. J. Bosteon, Vice-President, and Messrs. F. C. Hambleton and W. O. Skeat, members of the Society, made a formal presentation, on September 18, of the 0-4-2 locomotive *Gladstone*, of the former London Brighton & South Coast Railway, to the British Transport Commission. The presentation took place in the Railway Museum at York where the locomotive has been on exhibition since 1927.

Mr. T. H. Summerson, Chairman of the North Eastern Area Board, and a member of the British Transport Commission, received the locomotive on behalf of the Commission. Also present were Mr. H. A. Short, General Manager, North Eastern Region; Members of the North Eastern Area Board; Mr. J. H. Scholes, Curator of Historical Relics, B.T.C.; and Regional railway officers.

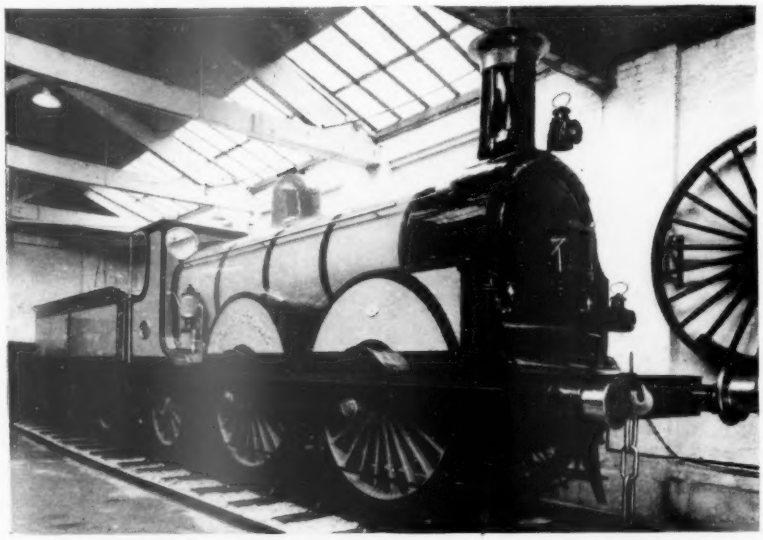
At the same time, a 12-in. dia. circular brass plaque was presented. It will be fixed to the locomotive. It is engraved with the inscription:—

"Preserved in 1927 by the Stephenson Locomotive Society and presented in their Golden Jubilee Year, 1959, to the British Transport Commission."

The *Gladstone*, designed by William Stroudley and built in 1882, was one of 36 similar locomotives built in 1882-91. It went into service in January, 1883, and was withdrawn in December, 1926, after travelling 1,346,918 miles.

It was purchased by the Stephenson Locomotive Society in 1927 for preservation and was sent to the then London & North Eastern Railway museum at York and formally handed over, on loan. It has remained in the museum since then, except during the war, when it was stored for safety at Reedsmouth.

The locomotive has been repainted and restored to its original condition. Much research has been undertaken by the Society to reproduce faithfully the original yellow ("Stroudley's improved engine green") livery.



L.B.S.C.R. Stroudley locomotive "Gladstone" in York Railway Museum

Staff and Labour Matters

Engineering and Shipbuilding Workers' Wage Claim

A claim by the Confederation of Shipbuilding & Engineering Unions for a substantial wage increase and a 40-hr. week for engineering and shipbuilding employees was submitted to the Employers' Federations.

Contracts and Tenders

Diesel-electric locomotives for the Iranian State Railways

General Motors Overseas Operations has received an order from the Iranian State Railways for 20 main-line diesel-electric locomotives of 1,900 h.p. running on three-axle bogies, and 20 diesel-electric shunting locomotives of 600 h.p.

Powell Duffryn Engineering Co. Ltd., recently received an order from the British Railway Traffic & Electric Co. Ltd., for ten 35-ton cylindrical tank wagons for the conveyance of Class "A" liquids specially designed for bottom loading and discharge, which is controlled from either side of the vehicle. The vehicles are mounted on Skefko roller bearing axleboxes through scroll iron and link suspensions and are equipped with International screw couplings and drawgear, and self-contained pneumatic buffers. To enable the vehicles to be used in fast traffic they are fitted, in addition to hand operated brakes, with clasp type vacuum brakes comprising two 21 in. dia. "E" cylinders.

The British Transport Commission, South Wales Docks, has placed the following contracts:

G. & A. E. Slingsby Limited: supply of steel hydraulic pressure pipes for Kings Dock Lock, Swansea Docks

The Stanton Ironworks Co., Ltd.: supply of return water pipes for Kings Dock Lock, Swansea Docks

Ransomes & Rapier Limited: one 3½-ton diesel-electric mobile crane for Dock Manager's Department, Cardiff

C. H. Bailey Limited: general overhaul of s.h.b. *Foremost* 27, South Wales Docks

E. Boydell & Co. Ltd.: one shunting tractor for Dock Manager's Department, Barry.

The Special Register Information Service Export Services Branch, Board of Trade, has received calls for tenders as follow:

From India :

An unspecified quantity of diesel shunting locomotives.

The issuing authority and address to which bids should be sent is the Government of India, India Supply Mission, 2536 Massachusetts Avenue, N.W., Washington 8, D.C. The tender No. is SE-55. This purchase will be financed by the Development Loan Fund of the United States Government. The closing date is October 27, 1959. The Board of Trade reference is ESB/21706/59/ICA.

From Portuguese East-Africa :

Spares for locomotives, including rubber rings for vacuum cylinders, rubber washers and diaphragms for rods and valves of vacuum cylinders, rubber joints for caps of vacuum cylinders, rubber hoses for vacuum cylinders, and delivery hoses for vacuum brakes, without nozzle.

The issuing authority is the Ports Railways & Transport Department, Lourenco Marques. The tender No. is 213/59. The closing date is October 2, 1959. Local representation is essential. The Board of Trade reference is ESB/21804/59.

From Formosa:

4,200 sets of freight wagon brake rigging and accessories
200 sets of wheel and axle assemblies
5,800 door and rope fasteners
1 set of springs and spring riggings
1 set of couplers and draft gear
1 set of air brake equipment
467 steel channels
108 steel angles
1,778 carbon steel plates
135 steel bars
226 gas pipes.

The issuing authority and address to which bids should be sent is the Central Trust of China, Purchasing Department, 68, Yen Ping Nan Road, Taipei, Taiwan (Formosa). The tender No. is US-622E. This purchase will be financed by the International Co-operation Administration (I.C.A.), the agency through which the United States Government gives economic and technical assistance to other countries. The closing date is 8 October, 1959. The Board of Trade reference is ESB/21452/59/ICA.

Further details relating to the above tenders together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1.).

The Government of Pakistan has called for tenders for the construction of a new bridge over the River Indus near Sukkur in replacement of the famous Lansdowne Cantilever Bridge. The new bridge has been designed by an American Consulting Engineer, Mr. D. B. Steinman and will consist of a steel-arch span measuring 807 ft. between bearings and the estimated cost is about £1,000,000. Specifications are stated to call for the use of British Standard steel, and erection is expected to take about 20 months. The bridge will carry the railway only but will be decked up to rail level so that road traffic could use it in case of emergency.

Notes and News

Gloucester Railway Carriage & Wagon Co Ltd. Dividend.—The board of the Gloucester Railway Carriage & Wagon Co. Ltd. at a meeting on September 18 recommended a final ordinary dividend of 1s. per 10s. unit, less tax, making 1s. 6d. per 10s. unit less tax for the year ended May 31, 1959, payable on October 31.

Glasgow Suburban Electrification.—Work is going ahead on the Glasgow Suburban electrification scheme, and this week, between Kings Park and Burnside, a start was made on the foundations for the overhead wiring system on the Cathcart Circle, Kirkhill and Neilston lines. The work has been carried out after the peak morning services have finished and before the evening rush begins.

Waterloo to be London Terminus of All Channel Islands Services.—All London boat trains in connection with British Railways services to and from the Channel Islands are to run from and to Waterloo as from November 2. This will apply to the services both *via* Southampton and *via* Weymouth. At present Waterloo is the terminus of the Southampton, and Paddington of the Weymouth, boat expresses. The new arrangement will afford faster journeys between London and Weymouth and lessen the risk of passengers going to the wrong terminus. It is being introduced simultaneously with the reduction of the service to three sailings each way a week as an economy measure. There will be sailings from Southampton on Wednesday and from Weymouth on Monday and Friday nights. The down boat express will leave Waterloo at 9.15 p.m. on all three nights and call at Basingstoke. The Weymouth boat train will call also at Southampton Central and Bournemouth Central. Inwards steamers will berth at Weymouth on Mondays and Wednesdays and at Southampton on Fridays. Boat trains will run to Waterloo on all three days.

East Indian Railway Officers' Dinner, 1959.—The 56th annual dinner of the East Indian Railways officers will be held at the Connaught Rooms, Great Queen Street, Kingsway, London, W.C.2, on Wednesday, September 30, at 6.30 for 7 p.m. The Chairman will be Mr. A. V. Venables. The principal guest will be Mr. David Faed MacMillan. The price of tickets is 22s. each. They can be obtained from the Hon. Secretary, Mr. R. C. Harvey, Aros Thona, Copthorne, Sussex: tel. (office) Victoria 8494, (residence) Copthorne 0115. The reunion tea party for members, their wives, families, and guests will be held at the St. Ermin's Hotel, Caxton Street, S.W.1, on October 1, from 3.30 to 6 p.m. The inclusive charge for one ticket will be 7s. (additional tickets 6s. 6d. each). Any members desiring tickets who have not applied already should do so forthwith to Mrs. Mona Cambridge, Horringford House, Luccombe Road, Shanklin, I.O.W.

Keelavite Hydraulics Limited Appoint South African Agents.—Keelavite Hydraulics Limited, of Allesley, Coventry, has appointed Holman Bros. (Pty.), Ltd., P.O. Box 6218, Johannesburg, as its agent for the sale of hydraulic equipment in South Africa and Rhodesia. Holman Bros. is manufacturing hydraulic cylinders under licence from Keelavite.

Production Exhibition, 1960.—The next Production Exhibition, the fourth in the series, will be held in the National Hall, Olympia, London, on April 25-30, 1960. As before, the exhibition will provide an up-to-date survey of those aids, techniques, and processes which result in greater efficiency when applied to industrial production. Conferences organised by the British Productivity Council, with the title Productivity, Men, and Methods, will be held during the exhibition. Details may be obtained from The Production Exhibition, 11, Manchester Square, London, W.1.

Vokes Limited at International Motor Show.—Maxivee long-life replacement oil filter elements will be the principal item on the stand of Vokes Limited at the International Motor Show in London on October 21-31. There are only five element sizes covering more than 275 applications on motor vehicle engines and so on. Vokes Limited also will show a range of paper-element air intake filters. For engine test bed filtration, there is the Top Servicing lubricating oil filter offering the facility of extremely easy servicing. The K.600 Kompak will be shown for air intake filtration of test beds and spray booths.

Henry Wiggin & Co. Ltd. Nickel Exhibition in Manchester.—A four-day exhibition illustrating the properties and uses of nickel and its alloys is to be given by Henry Wiggin & Co. Ltd., at the Midland Hotel, Peter Street, Manchester, on October 12-15. Displays will feature heat-resistance, corrosion-resistance, electrical resistance, and special physical properties. There will be over 350 examples of Wiggin alloy components covering power, transport, chemical engineering, industrial heating, electrical

equipment, and electronics. A series of supporting lectures and films should prove helpful to designers.

Henschel Delivers 30,000th Locomotive.—Delivery of the 30,000th Henschel locomotive to be built since the firm of Henschel & Son was formed in 1844, was celebrated in August at the works in Kassel. The first Henschel locomotive to be built was delivered on July 29, 1848 to Hessische Friedrich-Wilhelms-Nordbahn. This latest, shown in the illustration, is a Type "TT12" diesel-electric passenger locomotive, one of 18 similar units and six diesel-hydraulic locomotives for Ghana Railways. The Ghanian Ambassador at Bonn attended the ceremony.

Railway Benevolent Institution Grants.—At a recent board meeting the Railway Benevolent Institution granted annuities to seven widows, five members, and one child involving an additional liability of £299 16s. a year. Two hundred and ten gratuities were also granted amounting to £2,072 10s. to meet cases of immediate necessity. Grants made from the casualty fund for the months of July and August amounted to £2,470 9s. 6d.

Guard Drunk in Charge of a Passenger Train.—A guard was fined £10 with two guineas costs at Peterborough on September 18, after he had pleaded guilty to being drunk while a guard in the employ of the British Transport Commission, in charge of a passenger train. He is now a goods porter at Doncaster. The guard was in charge of the 10.45 p.m. train out of Kings Cross on September 10. Near Peterborough, just after midnight, the train was brought to an emergency stop outside the station, and two railway police officers who were among the passengers saw him fall on his face while trying to place a detonator on the line.

Visit of Danish Institution of Railway Signal Engineers.—Some 32 members of the Danish Institution of Railway Signal Engineers will visit Britain from September 27 to October 3. During the week they will see signalling installations on British Railways and will also visit the works of the Westinghouse Brake & Signal Co. Ltd., at Chippenham, and of the Siemens & General Electric Railway Signal Co. Ltd., at Wembley. They will be the guests of the Institution of Railway Signal Engineers at a cocktail party on September 30, and of the British Transport Commission at a dinner on October 2. Reference to the visit is also made in the Personal Section this week.

Institute of Traffic Administration, Lincolnshire Group Formed.—At a meeting at Boston on September 17, the Lincolnshire Group of the Institute of Traffic Administration East Midlands Centre was formed. The Group Chairman is Mr. W. Jackson of the Lincolnshire Road Car Co. Ltd., and the Secretary Mr. J. Barnett of the Tower Hill Transport Company. The group will meet at Boston, Grimsby or Lincoln, on the third Friday of each month. The first meeting will be at Boston on October 16. Mr. L. C. Harrison, a Vice-President of the Institute and Chairman of the East Midlands Centre, presided at the inaugural meeting, and Mr. A. C. Gibson, National Secretary of the Institute, was among those present and spoke on public transport in Germany and Italy.

U.A.M. Group Acquires Chancery Insulations Limited.—The U.A.M. Group has acquired the entire share capital of Chancery Insulations Limited. The latter firm has specialised in application of Seel sprayed asbestos, used *inter alia* on railway rolling stock, road vehicles, and buildings. It is claimed to be the only single process to offer a combination of thermal insulation, sound absorption, fire resistance, dust exclusion, and prevention of condensation and corrosion. Process work will be carried out at the U.A.M. Group factory at Watford. Application will be undertaken anywhere in the United Kingdom. The offices of the new subsidiary will be transferred on October 5 from 93-94, Chancery Lane, London, W.C.2, to 8, Upper Grosvenor Street, W.1 (tel. Grosvenor 5411). Mr. P. A. Lawrence, formerly Director & General Manager of Chancery Insulations, has been reappointed Executive Director.

The 30,000th Henschel locomotive to be built; a Type "TT12" diesel-electric unit for Ghana Railways

Railway Club Exhibition.—By the courtesy of the Curator of Historical Relics of the British Transport Commission, the Railway Club is arranging, from November 9 to 21, an exhibition of small historical relics, pre-grouping railway crests, documents and tickets at the headquarters of the Curator at Triangle Place, Clapham, London, S.W.4. The exhibition will be open from 6 p.m. to 9 p.m. on Mondays to Fridays, and from 2 p.m. to 6 p.m. on Saturdays and Sundays. The charge for admission will be 6d., and children under 16 must be accompanied by an adult.

Trico-Folberth Limited at the Paris Salon de l'Automobile.—Trico-Folberth Limited will be exhibiting for the tenth successive year at the Salon de l'Automobile, in the Grand Palais, Paris, on October 1-11. A range of windscreen washers will be shown, including four new products. These include the Duo-matic windscreen washer, now modernised with many new features. On one depression of the hand or foot control twin jets spray the screen automatically for 6 sec. Also exhibited will be the Duo-matic Spraywipe washer, which washes and wipes the windscreen in one operation; the Ato-matic windscreen washer, which draws power from the air in the spare tyre ; and the Vaco-matic windscreen washer, pre-charged to give instant action on actuating a control. All these will be demonstrated by working models. The full range of Trico products also will be displayed.

British Transport Commission Visits Southampton and Bournemouth.—The British Transport Commission, in accordance with the policy of holding some of its meetings outside London, so as to keep touch with industrial, business, and trading interests, met in Southampton on September 17, during a tour in that area from September 16 to 18. Members of the Commission visited transport installations and met personalities in civil affairs, trade, and industry. The formal business meeting, at which Sir Brian Robertson, Chairman of the Commission, presided, was held in the morning of September 17, after which Sir Brian Robertson and his colleagues inspected the Ocean Terminal. In the afternoon they visited the docks and met representatives of the staff. Next day an inspection was made of the British Road Services depot, vessels and quay, used for traffic to the Isle of Wight. A visit to the Hants & Dorset Motor Services Limited Omnibus Station at Bournemouth concluded the programme.

Reduced Winter Service via Southampton/Havre.—The reduced winter service will again operate on the Southampton/Havre route from November 2 to March 19, 1960. There will be sailings from Southampton to Havre on Mondays and Fridays, and from Havre on Tuesdays and Saturdays.

Murex Purchase of Donald Ross & Partners Shares.—Murex Welding Processes Limited has purchased the whole of the issued shares of Donald Ross & Partners Limited, of Crawley, Sussex, designers and manufacturers of mechanical aids to production, including Twinner positioners for hand and automatic welding. Donald Ross & Partners Limited will continue to operate as in the past and under the same name and the same management. The association is expected to enable both companies to offer individually and jointly an efficient service to users of welding and to firms contemplating installation of mechanical production aids.

Further Withdrawals of Services in Eastern Region. — Wentworth Station, between Barnsley Courthouse and Sheffield Midland, in the Eastern Region of British Railways, will be closed to all traffic from November 2. Passengers will be catered for at Elsecar & Hoyland and at Chapeltown South, and by road services in the area. A C. & D. service for parcels and goods sundries traffic will continue to be available. Goods traffic in full wagon loads and livestock will be dealt with at other stations in the district. From the same date the Eastern Region is to withdraw the passenger service from Beckingham Station between Doncaster and Gainsborough. Passengers can use Misterton and Gainsborough Stations and local bus services. Parcels and freight sundries C. & D. services operate from Gainsborough, where facilities will also be available for accepting parcels for despatch or awaiting collection. Full wagon loads will continue to be dealt with at Beckingham.

Railway Stock Market

Optimism as to the outcome of the general election maintained a firm undertone in stock markets and resulted in a further up-swing in steel shares, but fears of a fresh set-back on Wall Street affected sentiment to some extent and made for caution. Not much selling was reported and the heavy fall in the shares of the Jasper group of property companies had no widespread repercussions, which shows that stock markets are in a healthy condition. Continued talk of prospects of a higher bank rate later in the year had a restraining influence, particularly in the gilt-edged section.

Very little business was reported in foreign rails. Antofagasta ordinary eased from 14 to 13¾, and the preference stock was 23½ compared with 24 a week ago; the 5 per cent (Bolivia) debentures remained at 90½. United of Havana second income stock kept at 6. Mexican Central "A" bearer debentures came back from 59¼ to 58½. San Paulo Railway 3s. units at 1s. 9¾d. compared with 1s. 6d. a week ago. Brazil Railway bonds were again 5¾.

There was less business in Costa Rica stocks, which, however, held their recent good rise, the ordinary stock being 17½, and the first and second debentures 80½ and 90½, respectively.

International of Central America common stock again had a quotation of $20½ and that for the preferred stock was also unchanged at $102½. Guayaquil & Quito assented bonds were 81½.

Nyasaland Railways shares were 10s. 6d. ower and the 3½ per cent debentures 57½. West of India Portuguese capital stock was 106½. Barsi changed hands at 29. Paraguay Central first debentures were 22.

Canadian Pacifics came back with Wall Street again, and were $48, compared with $49¼ a week ago, while the preference stock eased from 57⅞ to 56½ and the 4 per cent debentures from 64¾ to 64½. White Pass shares remained at $13¾.

Among shares of locomotive builders and engineers, Beyer Peacock 5s. shares firmed up to 8s., a gain of 3d. compared with a week ago. North British Locomotive were 11s. 6d. compared with 11s. 9d., and Birmingham Wagon held their recent rise to 29s. 10½d. Gloucester Wagon 10s. shares strengthened from 17s. 6d. to 18s. and Wagon Repairs 5s. shares eased from 10s. to 9s. 9d. On the other hand, although not keeping best prices, Charles Roberts 5s. shares rose on balance from 11s. 9d. to 13s. 6d. The quotation for G. D. Peters shares was marked down to 18s. 1½d., but the shares remained firmly held.

Westinghouse Brake remained active and rose afresh from 48s. 3d. a week ago to 49s. A feature was a sharp decline in Vickers from 30s. 6d. to 28s. 6d., following news of the fall in profits for the half-year, mainly because of declining sales of aircraft. The fall in the shares reflected doubts whether the year's dividend total will be maintained at 10 per cent, though meanwhile the interim dividend is being kept at 2½ per cent.

Pressed Steel 5s. shares have risen from 30s. 10½d. to 32s., while Dowty Group 10s. shares strengthened from 36s. 6d. to 37s. and Stone-Platt at 50s. 3d. compared with 51s. 3d. a week ago. Davy United, which remained under the influence of the annual statement, have risen afresh from 79s. to 81s. 6d. Reflecting the rise in steel shares, Guest Keen were 71s., compared with 68s. 9d. a week ago, but T. W. Ward eased from 110s. to 99s. Pollard Bearing 4s. shares at 29s. 6d. were within 3d. of the price a week ago and Ransomes & Marles 5s. shares rose from 21s. 6d. to 23s. Ruston & Hornsby reacted to 23s. Birmid were 83s., Babcock & Wilcox 48s. 3d. and B.S.A. 48s. Associated Electrical eased from 61s. a week ago to 60s. 3d., despite the higher half-yearly profits. English Electric were a few pence higher on balance at 43s. 9d. and General Electric rose afresh from 39s. 6d to 40s. 6d.

Forthcoming Meetings

September 25 (*Fri.*).—The Railway Correspondence & Travel Society, London Branch, at the Railway Clearing House, Eversholt Street, London, N.W.1, at 7.15 p.m. Paper on "The North London Railway," illustrated by lantern slides.

September 26 (*Sat.*).—The Railway Correspondence & Travel Society, Bristol and South Gloucestershire rail tour.

September 26 (*Sat.*).—Permanent Way Institution, East Anglia Section, at Ipswich, at 2.15 p.m. Paper on "Work of the B.T.C. mining service," illustrated by lantern slides, by Mr. M. Fletcher.

September 28 (*Mon.*).—Railway Correspondence & Travel Society, Northampton Branch, at the Liberal Club, Castilian Street, Northampton, at 7.30 p.m. Illustrated paper on "Some interesting continental locomotives," by Dr. P. Ransome-Wallis.

September 29 (*Tue.*).—Railway Correspondence & Travel Society, East Midlands Branch, at the N.C.S. Guild Room, Toll Street, Nottingham, at 7.30 p.m. Paper on "Railway scenes at home and abroad," illustrated by colour slides, by Mr. D. Swale.

September 30 (*Wed.*).—East Indian Railway Officers' annual dinner at the Connaught Rooms, Great Queen Street, W.C.2, at 6.30 for 7 p.m.

October 1 (*Thur.*).—East Indian Railway reunion tea party for officers and their families, at the St. Ermins Hotel, Caxton Street, S.W.1, from 3.30 to 6 p.m.

October 2 (*Fri.*).—The Railway Club, at the Royal Scottish Corporation, Fetter Lane, London, E.C.4, at 7 p.m. Paper on "Some interesting cases in railway law," by Mr. A. J. F. Wrottesley.

October 2 (*Fri.*).—The Railway Correspondence & Travel Society, Lancs & N.W. Branch at Room 12, North Block, Platform 6, Preston Station, at 7.15 p.m. Colour slide display.

October 6 (*Tue.*).—Permanent Way Institution, Leeds & Bradford Section, in the British Railways Social & Recreation Club, Ellis Court, Leeds City Station, at 7 p.m. Paper on "Long welded rail track renewal in the N.E. Region," by Mr. P. Chalmers, Assistant to Chief Civil Engineer, York.

October 6 (*Tue.*).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, Cardiff Section, at the Angel Hotel, Cardiff, at 6.30 p.m. Paper on "Phases of road passenger transport over the years," by Mr. E. J. Phillips, Director & General Manager, Red and White Services Limited.

October 7 (*Wed.*).—Electric Railway Society, at the Fred Tallant Hall, 153, Drummond Street, London, N.W.1, at 7.15 p.m. Paper on "Keeping Underground wheels turning," by Mr. J. G. Bruce.

October 8 (*Thur.*).—British Railways, London Midland Region Lecture & Debating Society, in the Clerical Staff Dining Club, Cardington Street, Euston, N.W.1. at 5.45 p.m. Debate with Southern Region Society.

OFFICIAL NOTICES

CITY OF SHEFFIELD
SEWAGE DISPOSAL DEPARTMENT
BLACKBURN MEADOWS WORKS
RECONSTRUCTION AND EXTENSIONS
PHASE I—SLUDGE TREATMENT PLANT—
CONTRACT NO. BM(RS)17
SUPPLY OF STANDARD GAUGE RAILWAY MATERIAL (Part 2)

TENDERS are invited for the supply of the following railway material:—

4 No. Turnouts and 26 tons of rails in 95 lb. per yard Used Bullhead Rails and all necessary chairs.
250 No. New or second-hand Grade 3 sleepers.
1,050 ft. Crossing timbers of new pressure creosoted or good second-hand material.

Form of tender, Specification and Bills of Quantities can be obtained on application to the undersigned on payment of a deposit of £2 2s. which will be returned on receipt of a bona-fide Tender not subsequently withdrawn.

Tenders in the official envelope provided, which must bear no indication of the Tenderer, must be delivered to the Town Clerk, Town Hall, Sheffield, 1, not later than 12 noon on Wednesday, October 7, 1959.

JAS. H. EDMONDSON.
General Manager and Engineer.
Sewage Disposal Department,
Wincobank, Sheffield, 9.

GOVERNMENT OF SIERRA LEONE

ACCOUNTANT required by GOVERNMENT OF SIERRA LEONE Railway Department, for appointment for 2 tours of 18/24 months in first instance. Commencing salary according to quals. and expce. in scale (including Inducement Pay) £966 rising to £1,666 a year. Gratuity 15% of total salary drawn. Outfit allowance £60. Free passages. Children's allowances of £48/£144 a year or grant up to £288 annually for their maintenance in U.K. Liberal leave on full salary. Candidates must be over 30 and have sound knowledge of general accountancy principles and factors governing analysis of railway revenue and expenditure. They must be thoroughly proficient in manipulation of stores, workshop and construction accounts. Knowledge of railway statistics, renewals fund, mechanised accounting or machine aids would be desirable.

Applicants now serving with the British Railways would be eligible for secondment for tour of 18/24 months with salary in scale £900 rising to £1,542 a year and they should apply through their local offices. Other applicants should write to the CROWN AGENTS, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience, and quote M3A/52542/RA.

BRITISH RAILWAYS (Southern Region) require a DEVELOPMENT ASSISTANT in the London Area.

Applicants must have a good knowledge of railway electric traction, machines and control equipment, the proof testing of which under service conditions will be the primary duty. Familiarity with testing techniques and equipments is also required. Knowledge of principles of coach running and brake equipment will be advantageous. Minimum qualification required is graduateship I.E.E. or I.Mech.E.

Salary range £1,045/£1,150.

Application forms may be obtained from the Chief Mechanical and Electrical Engineer, British Railways, Southern Region, 15, St. Thomas' Street, London Bridge, S.E.1.

GHANA PUBLIC SERVICE COMMISSION

APPLICATIONS are invited for the post of ENGINEER (HARBOUR BRANCH), GHANA RAILWAY.

Duties: Responsible to the Port Authority for maintenance of wharves, breakwaters, buildings, railway tracks and all other civil engineering installations in Tema Harbour area as well as for new works.

Qualifications: 1. Candidates must:—(*a*) hold a B.Sc.(Eng.) or other recognised engineering degree and must have gained not less than two years' practical post-graduate experience; or (*b*) being not less than 23 years of age, have passed Parts I and II of the examinations of the Institution of Civil Engineers. 2. Candidates must also have obtained not less than three years' practical experience on harbour works after qualifying in terms of (*a*) or (*b*) of paragraph 1 above. Salary range £1,080-£2,080.

Appointment on contract/gratuity terms for two tours each of 15-18 months in the first instance. Gratuity at rate of £12 10s. for each completed month of service. Free passages for officer, wife and up to three children under 18 years, and in addition an education allowance for children when not resident in Ghana of £100 a child for up to three children under 18 years. Outfit allowance £60/£30. Accommodation at low rental. Interest-free advance for car and car maintenance allowance. Generous home leave on full pay. Income tax at low local rates. Preservation of superannuation or pension rights, where applicable, may be arranged.

For further particulars and application forms write stating age, qualifications and experience to THE DIRECTOR OF RECRUITMENT, GHANA HIGH COMMISSIONER'S OFFICE, 13, BELGRAVE SQUARE, LONDON, S.W.1.